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An Independent Audit of Forest Management on the Black Sturgeon Forest for the Period 2001 to 2006

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BioForest

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1.0 EXECUTIVE SUMMARY

BioForest Technologies Inc. carried out an independent audit of forest management on the Black Sturgeon Forest (BSF) covering the period from April 1, 2001 to March 31, 2006. The BSF has been managed through this period under Sustainable Forest License (SFL) #542500 by Bowater Canadian Forest Products Inc. (Bowater). The audit examined Bowater's compliance with the terms and conditions of its SFL for the BSF and reviewed the Ontario Ministry of Natural Resources' (OMNR) performance in meeting its obligations on the BSF. The audit included an extensive review of the plans and records of forest management activities and field verification visits to areas where a variety of forest management activities occurred during the audit period. Public input was solicited through a public mailing, newspaper advertising, mail-in surveys, public meetings, and a shopping mall booth.

This audit report identifies 27 recommendations and 8 suggestions, aimed at improving the management and administration of the BSF. Three areas raise the greatest concern. The first is the administrative structure OMNR uses to oversee management of this forest. Two OMNR Districts, three local citizens' committees, four biologists, and three or four foresters all share responsibilities. This has been the subject of recommendations for over ten years and needs to be addressed.

The second concern is that harvest on this forest has not been within 40% of the targeted volume or area for over 15 years. This represents a loss of economic benefit from the Forest, and does not build confidence that the public landbase that is the BSF is generating sufficient benefits. The audit recommends OMNR examine the chronic shortfall, and examine benefits for marketing any surplus timber.

The third concern is that the silvicultural trust fund has fallen below the minimum balance due to deferral of payments by an overlapping licensee. Funds have been deferred with the full knowledge and participation of OMNR head office, but local OMNR staff and the SFL holder were not party to any of the negotiations and, in fact, were not formally notified that the funds had been deferred until some time after the payment had been stopped.

Other aspects requiring corrective action or improvement on Bowater's part relate to improving effectiveness of slash management, conducting an inventory of older water crossings to ensure they are not causing harm to aquatic environments, and ensuring free-to-grow and silvicultural assessment are effective. The audit also recommends that the Company ensure buffer zones for aerial herbicide applications only exceed required minimum standards with exceptional rationale. The audit recommends the OMNR improve caribou habitat use information and collect cold water stream values information.

The audit confirms that this is a well-managed forest. Technical aspects of forest management are completed in a satisfactory manner. Communication between the

various stakeholders on the Forest is good and relations are professional. The licensee is satisfactorily meeting all of the terms and conditions of the SFL. OMNR is also meeting its overall responsibilities associated with its role in managing this forest. The audit team confirms that, based on the evidence reviewed, management of the Forest was in compliance with the legislation, policy, and regulations that were in effect during 2001-2006 audit term. The BSF is being managed sustainably. The audit team has recommended that the term of the SFL be extended for an additional five years.

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2.0 INTRODUCTION

An Independent Forest Audit (IFA) of the Black Sturgeon Forest (BSF) was undertaken in the fall of 2006 to ensure that forest management activities were carried out in accordance with the plans, guidelines, regulations and legislation in force during the five years from April 1, 2001 to March 31, 2006. This audit was conducted in compliance with the *Crown Forest Sustainability Act* (CFSA) (Statutes of Ontario 1994) and fulfills a requirement of the *MNR's Class Environmental Assessment Approval for Forest Management on Crown Lands in Ontario* (Ontario Ministry of Environment and Energy 2003). The audit assessed the effectiveness of forest management activities in achieving the management objectives for the BSF. Also examined was the compliance of Bowater Canadian Forest Products Inc. (hereinafter referred to as "Bowater," the "Company," or the "SFL holder"), with the terms and conditions of Sustainable Forest License (SFL) #542500 for the BSF, issued on May 9, 2001. Finally, the audit reviewed the Ontario Ministry of Natural Resources' (OMNR) performance in meeting its obligations on the BSF.

A team organized by BioForest Technologies Inc. conducted the audit. The audit team consisted of three Registered Professional Foresters, a biologist/ecologist, a socio-economist, and a secretariat. Each member of the team was assigned specific duties and responsibilities. A list of the audit team members and their qualifications is presented in Appendix B.

The audit was conducted under the guidance of the 2006 *Independent Forest Audit Process and Protocol* (IFAPP) (OMNR 2006). The IFAPP outlines eight principles upon which the audit is based; these are listed in Appendix C. The principles define the major features of forest management that were audited. Each principle is supported by a series of criteria. The IFAPP describes how each criterion should be audited and specifies the evidence that should be available for the auditors to use to assess compliance with the criteria.

To measure and assess auditee performance, the audit team considered all eight IFAPP principles collectively. In total, the protocol identifies 125 criteria that were applicable to this forest and assessed as part of the audit. The audit team analyzed the findings from the audit and, where appropriate, noted any failures, non-compliances, or exceptional practices related to individual principles or criteria. This report summarizes the findings and presents recommendations and suggestions. Recommendations are presented where, in the opinion of the audit team, the auditees have not met a performance requirement or where an observation, or a collection of observations, has led the auditors to conclude that there is an issue of concern. Auditees are expected to design, document, and implement specific remedies for the issues raised through recommendations. Suggestions have been made for situations where the audit team anticipates the auditees could elevate their forest management practices above the minimal standard.

2.1 Audit Process

The auditors collected evidence through document review, interviews with staff and stakeholders, and physical inspections of field activities that occurred on the BSF between April 1, 2001 and March 31, 2006. The audit process began with an information meeting in Thunder Bay on March 22, 2006. The purpose of the meeting was for the lead auditor and the auditees (Bowater and OMNR) to discuss audit logistics and for the lead auditor to collect background information and documents for the audit. Following the information meeting, an audit plan was written and distributed that outlined the audit schedule and identified the main contacts for the audit.

From July 15 to August 30, 2006, the audit team reviewed documents describing forest management activities on the BSF from 2001 to 2006. Interviews were held with a variety of interested parties, including Local Citizens' Committee (LCC) members from the three LCCs that comment on the BSF. Company and OMNR staffs were interviewed throughout the auditing period. Most interviews took place in person, but contact between the audit team, auditees, and the public by phone and e-mail was common.

Using the mailing list that the OMNR maintains for the BSF, a survey was sent to 614 stakeholders on September 1, 2006. The survey was also posted on the BioForest Technologies Inc. web page. An open house was hosted at the Nipigon Community Centre on August 8, 2006, and a public information booth was hosted in the Intercity Shopping Centre in Thunder Bay on August 9 and 10, 2006. The open house and the public information booth were advertised in the Nipigon Red Rock Gazette on August 1, 2006. The purpose of the survey, the open house, and the information booth was to provide members of the public with an opportunity to comment on the forest management that occurred on the BSF over the audit period. The audit team received 22 responses to the survey, a return rate of about 4%. Thirty-two people visited the public information booth. About 56% of the visitors discussed the BSF specifically, while the remaining visitors were interested in the audit process in general.

A pre-audit meeting was held in Thunder Bay on August 10, 2006, to discuss the audit schedule, auditee staff requirements, issues, contacts, and auditor assignments. Also, on August 10, 2006, the lead auditor completed initial field site visits on the BSF.

The lead auditor completed field site selection on August 10, 2006. The site visits were selected to evaluate harvest, renewal, tending/maintenance, free-to-grow (FTG) operations, areas of concern (AOCs), road construction and maintenance, site preparation, water crossings, wildlife management activities, and other areas of special interest. Sites that had multiple audit values (e.g., renewal and AOC) were preferentially selected. Sites visits were selected to ensure that the audit team observed all geographic areas of the Forest during the field inspections. Samples were stratified to ensure that evaluations of winter and summer operations were representative of actual operations.

On-site and field audit activities occurred from October 2-6, 2006. The objective of the site visits was to evaluate forest operations that had been carried out between April 1,

2001 and March 31, 2006, and to assess compliance with plans and prescriptions and the effectiveness of management activities.

The audit team verified records and information systems in the Bowater and OMNR offices. The team split into two field crews, each of which was accompanied by Bowater and OMNR staff. An LCC representative accompanied one audit team through each field day. Sampling was completed through nine person days of field inspections. One of these person days focused on lowland or inaccessible sites using a helicopter. Sampling continued until the auditors had viewed all of the selected sites and were satisfied that they had viewed enough sites to be confident in their assessment of field performance.

Field sampling was designed so that a minimum of 20% of the areas that had been harvested within the audit period was sampled. The auditors visited 65 sites, covering approximately 8,122 ha depleted by harvest during the audit period (a sample of approximately 56%). In total, the audit team inspected 48 sites that had harvest activity, 31 sites that had silvicultural activity (i.e., renewal [4811 ha planted, 1787 ha seeded, and 3328 ha declared naturally regenerated], site preparation [8592 ha] or tending [2355 ha], a sample of approximately 40%), and 16 sites that had been declared FTG. Over the course of the field audit, the auditors made formal observations on 38 AOCs.

It is important to understand that the percentages noted above overstate the sampling intensity. It is accurate to state that 65 sites were visited, and that the site visits always involved direct inspection of a sample of all activities that were present on the site. For example, a site may have been selected to confirm the harvest activities, but auditors would always note other activities that had occurred on the site as well. However, the audit did not inspect the entire area listed on the block.

Sample testing was undertaken on the Forest Renewal Trust Fund accounts by visiting sites in the field for which reimbursements had been made for the 2004-2005 season. The *Specified Procedures Report* (KPMG 2006a and KPMG 2006b) was commissioned by OMNR during the audit term as a selected review of the reimbursements paid out to SFL companies under the terms of the Forest Renewal Trust Agreements. The sampling objective for the *Specified Procedures Report* is similar to the objective for the operations sample; that is, approximately 20% of the sites identified in the report. A comparison between the sites identified in the *Specified Procedures Report* and those sites visited by the audit team demonstrated that the actual sampling rate was approximately 42% overall.

2.2 Forest Management Context

The SFL for the BSF (SFL #542500) was issued on May 9, 2001. Its most recent amendment was issued on March 1, 2006.

Located north of the City of Thunder Bay, the BSF has four separate geographic parcels. The Main Parcel, Current River Parcel, North Parcel, and Caribou East Parcel lie south,

southwest, west, and northwest of Lake Nipigon, respectively. The boundary of the BSF is shown with other significant reference features in Figure 1 of Section 2.2.1 of this report. The BSF has a well-developed primary and secondary road system.

The planning and overall administration of the BSF is the responsibility of the OMNR and Bowater. The BSF is separated by the boundary that separates the OMNR Nipigon District from the OMNR Thunder Bay District, both of which are in the Northwest Region of the OMNR. For the OMNR, the Nipigon District office is responsible for the overall administration of the BSF, but operational duties for the individual parcels is split between the two District offices. The Nipigon District office administers the Main Parcel and the Thunder Bay District office administers the other three parcels.

The distance from the northern boundary of the Caribou East Parcel to the southern boundary of the Current River Parcel is approximately 215 km. The Main Parcel is considered the core portion of the BSF and covers about 50% of the Forest. Highway 527, Highway 11/17, and the Black Sturgeon Road provide access to the parcels.

Timber extraction is the main industrial use of the BSF and it contributes significantly to the local economy. About 170 people from Bowater's woodlands operations work on the BSF. Mining and mineral extraction is another industrial use of the BSF. The Ministry of Northern Development and Mines (MNDM) considers there to be moderate mineral potential in the BSF. There are a number of amethyst deposits in the Current River Parcel, and there are productive amethyst mines between the Current River Parcel and Highway 11/17.

Non-industrial uses of the BSF include tourism, trapping, cottaging, canoeing, camping, hunting, angling, boating, wildlife viewing, recreation, and berry-picking. There are 25 tourist operators, 27 registered trap lines, and 8 cottage lakes within the BSF boundaries. Canoe routes in the BSF include the Black Sturgeon River, Gull River, Kopka River, and Kiaske River.

The Black Sturgeon Lake and River System also provides opportunities for canoeing, camping, hunting, and angling. Fish species found in lakes and rivers within the BSF include brook trout, pike, walleye, whitefish and perch. Lakes and streams in the Main and Current River Parcels have speckled trout.

Moose, deer, and bear hunting in the BSF are important to individual hunters, as well as to the local economy. The BSF has portions of the following three Wildlife Management Units (WMUs) that are administered by the OMNR: 13, 15B and16C. There are 15 bear management areas in the BSF.

In 1999, three parks and three conservation reserves were established in the BSF under the Ontario Living Legacy (OLL) Land Use Strategy: Black Sturgeon River Provincial Park, Gull River Provincial Park, Obonga-Ottertooth Provincial Park, Lake Nipigon Conservation Reserve, Ottertooth Conservation Reserve, and East Bay Conservation Reserve. The four Provincial Parks and one conservation area that were already in the

BSF prior to OLL are Kabitotikwia River Provincial Park, West Bay Provincial Park, Kopka River Provincial Park, the Albert Lake Mesa Provincial Park, and the Shook Lake Conservation Reserve. Enhanced Management Areas (EMAs) are non-park/conservation areas designated for special use according to their particular physical attributes. The BSF has three EMAs: Gull Bay, South Lake Nipigon, and West Lake Nipigon.

Timber harvesting in the Thunder Bay area began over a century ago. The Main and North Parcels have been continually harvested since the 1930s/1940s. Harvesting on the BSF between the 1930s and 1980s removed mainly spruce, fir, and pine. Hardwood became an increasingly important crop from the late 1980s to the present. The current forest composition reflects this long harvest history and the changing directions provided by the OMNR over that period.

The following mills are supplied with sawlog, pulp wood or veneer fibre from the BSF: Bowater Canadian Forest Products Inc., Buchanan Northern Hardwoods Inc., Buchanan Northern Hardwoods Birch Inc., Northern Sawmills Inc. (Buchanan), Great West Timber Ltd. (Buchanan), and Levesque Plywood Ltd. Bowater contractors and Shuniah Forest Products Ltd. are the primary harvesting operators on the BSF, and Buchanan Forest Products Ltd. and Niigaani Enterprises Inc. are overlapping licensee operators.

Communities that received wood from the BSF during the audit period include Nipigon, the Municipality of Oliver Paipoonge, Terrace Bay, and Thunder Bay. First Nations whose traditional territories and/or communities are adjacent to or within the BSF include: The Biinjitiwaabik Zaaging Anishinaabek (BZA) First Nation community, the Fort William First Nation (FWFN) community, the Kiashke Zaaging Anishinaabek (KZA) First Nation community, the Red Rock Indian band, the Whitesand First Nation, and the community of Collins.

2.2.1 Map of Management Unit

Figure 1 presents a map of the BSF.

2.2.2 Forest Description

The BSF is located in the Quetico-Nipigon area of the Canadian Shield. Portions of the Forest are dominated by flat top mountains and steep-sided valleys. The Main Parcel has variable topography, with clay soils along and west of the Black Sturgeon River Valley and thinner glacial tills at the higher elevations. Up to 83% of the Current River Parcel has thin soils over bedrock. The North Parcel has very little relief, except around Lake Nipigon. Soils in the North Parcel are mainly lacustrine in origin. The Caribou East Parcel is sectioned by a large number of lakes and the soils are generally thin.

Figure 1. Map of the Black Sturgeon Forest.

The BSF is characterized by cold winters and warm to cool summers. Lakes Superior and Nipigon cause lake effects that result in climatic moderation in the Main, Current River, and North Parcels.

The southern parcels of the BSF are dominated by boreal mixedwood forests whose stands combine the following hardwood and softwood species: black spruce, balsam fir, poplar, and white birch. The northern parcels are dominated by boreal conifer species and species composition in the north is less diverse than in the south.

Table 1 presents a summary of the managed Crown land on the BSF for 2001-2006. The total area shown in Table 1 does not include parks or protected areas that fall within the management unit boundaries. Black spruce, white birch, and poplar are the predominant tree species on the BSF.

Table 1. Landbase summary for Crown lands on the Black Sturgeon Forest (2001-2006).

Land class	Area (ha)	Percent total area	Percent production forest
Non-forested			
Water	36,481.0	8.1%	
Other land	787.5	0.2%	
Forested			
Non-productive	19,245.1	4.3%	
Protection	5,423.2	1.2%	
Production forest			
B&S/NSR	41,982.9	9.3%	9.9%
Depleted	84,970.4	18.8%	20.0%
White pine	271.2	0.1%	0.1%
Red pine	21.2	0.0%	0.0%
Jack pine	40,488.2	9.0%	9.5%
Black spruce	101,063.6	22.4%	23.8%
Balsam fir	3,364.6	0.7%	0.8%
Black ash	26.7	0.0%	0.0%
Cedar	12,100.0	2.7%	2.8%
Larch	568.3	0.1%	0.1%
Poplar	62,626.5	13.9%	14.7%
White birch	77,874.7	17.3%	18.3%
Total production forest	425,358.3	94.4%	
Total forested land	450,026.6	99.8%	
Total area	450,814.1	100.0%	

Source: Comparison and Trend Analysis of Planned Versus Actual Forest Operations Report for the Black Sturgeon Forest

Figure 2 presents the age class structure of the BSF by working group. Overall, the BSF has a large area that is in the 1-20 age class or categorized as barren and scattered (B&S) (31.0%). A large area of the BSF is in the 41-80 year age class (45.7%). Only 7.5% of the BSF is in the 21-40 year age class, and 16.0% of the BSF is mature or overmature (81+ years).

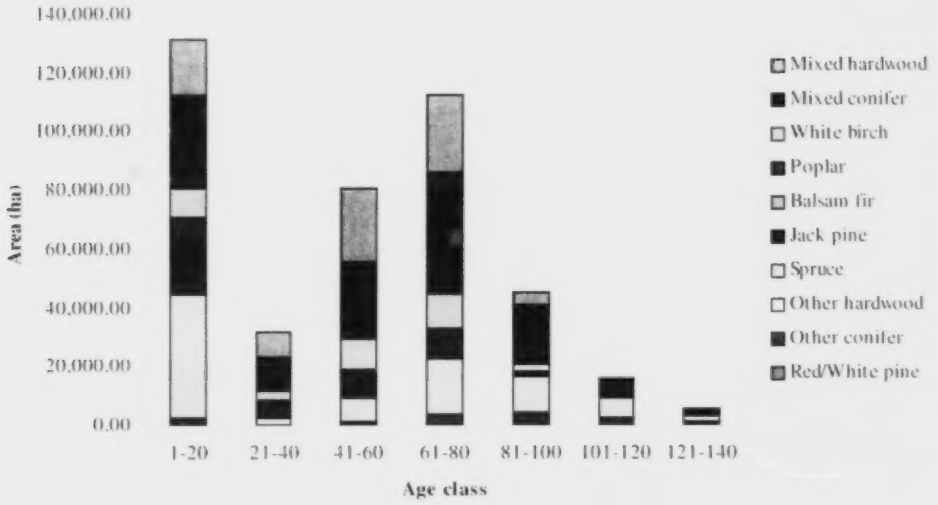

Figure 2. Age class distribution of working groups on the Black Sturgeon Forest, 2001-2006.

Extensive spruce budworm outbreaks occurred on the BSF in the 1940s/1950s and in the 1980s/1990s. In both cases, balsam fir and spruce were killed and large fires followed about 10 years later. Between 1996 and 1999, over 71,000 ha of the BSF were damaged by fire. Salvage operations occurred on 2,045 ha of fire and insect damaged forest in the 1996-2001 term, and on 10,200 ha at the beginning of the 2001-2006 term.

Harvest over the last three planning terms totalled nearly 50,000 ha. The combination of the natural losses due to fire and harvest depletions has resulted in 31% of the production forest being categorized as B&S or being in the youngest, 1-20 year old, age class. The B&S portion of the Forest should decline during the period of the new plan, as depleted stands reach FTG status and are re-entered into the working forest.

Due to the most recent spruce budworm outbreak and the resulting fires, there has been a decrease over large portions of the BSF in the abundance of balsam fir, a preferred host of spruce budworm. There has been an increase in the abundance of species less preferred by budworm, such as hardwoods, jack pine, and black spruce.

The BSF has many wildlife species that are common to the Boreal Region of Ontario. Over 60 species of songbirds breed in the BSF area, including ovenbirds, red-eyed vireos, Swainson's thrushes, bay-breasted warblers, and yellow-bellied flycatchers. Other wildlife species commonly present in the BSF include woodpeckers, sapsuckers, owls, grouse, crows, bald eagles, bears, porcupines, chipmunks, mink, marten, voles, mice, snowshoe hares, foxes, wolves, deer, moose, northern leopard frogs, wood frogs, American toads, and redback salamanders. The Forest also contains less common species, such as the woodland caribou, white pelicans, and sandhill cranes.

The Great Lakes-St. Lawrence system and the Hudson Bay-James Bay system are the two primary watersheds that drain the BSF. They are both cold water systems that have trout and salmon. There are many large lakes in the BSF that are classified as cool water fisheries, and many cold water fisheries that have salmonid species such as lake trout.

2.2.3 Forest Management Issues

Challenges and issues are to be expected when managing a public forest in Ontario. The following 19 issues were identified from the 2001 and 2006 BSF FMPs, and through interviews with staff from the Company and the OMNR Nipigon and Thunder Bay Districts:

1) *Current forest composition:* Compared to conifer-dominated stands on the BSF, the number of hardwood-dominated stands has significantly increased in the last 80 years. The BSF appears to have fewer pure stands than in the past. While upland conifer forests appear to be under-represented, mixed hardwood forest units are over-represented. There are also fewer older stands than expected.

2) *Full use of allocated timber resource*: Bowater has not fully utilized the planned harvest for some time. Reasons for this include market conditions, the need to divert operations to salvage operations, operators being unable to fully cut allocated areas, and labour disputes.

3) *Fibre supply*: Fibre shortages may occur on the BSF sooner than on other forests in the Region. On the BSF, fibre shortages are due to recent fires, historic harvest practices, extensive spruce budworm damage, and a decline in marketable timber in older stands.

4) *Timber and non-timber inventory information*: Issues regarding inventory information include the following: a) When the 2001 FMP process began, Bowater was in the midst of developing an ecologically based and statistically valid forest resource inventory (FRI). The new FRI was not available until the fall of 1999, which affected plan production. b) Values information collected and maintained by OMNR on their Natural Resources Values Information System (NRVIS) was often not available to Bowater or was inaccurate. c) Most streams on the BSF have not been adequately classified because of provincial fiscal constraints with respect to the

collection of critical values information. d) As an action plan item for a recommendation from the 1996 IFA (Wainman and Kydd 1996), Bowater was going to explore the opportunities for more site specific harvesting and OMNR was going to apply for data collection funding. OMNR did apply for funding, but it was not received in time for submission of the final 2001 FMP.

5) *Long-term road use strategy*: There is currently a lack of information regarding road use and maintenance for many BSF roads. In addition, many of the main roads in the BSF are shared by multiple SFL holders with conflicting road use requirements.

6) *Spruce budworm*: The 1981-1993 budworm event on the BSF contributed to the current forest condition of a large component of dead, dying, or damaged balsam fir and/or spruce trees and, in some stands, highly competitive shrub and herbaceous layers. Affected stands present operational viability problems, predispose areas to disease and fire, affect regeneration, and cause shortage of wildlife habitat consisting of young and old conifer cover.

7) *Forest fragmentation*: Historic forest harvesting practices and the application of the *Timber Management Guidelines for the Provision of Moose Habitat* (OMNR 1988) have resulted in the BSF having a high number of small sized disturbance areas and fewer large sized disturbances compared to what would be expected following large-scale natural disturbance events such as fire. While small harvest blocks benefit moose habitat, forest fragmentation may be detrimental to species such as marten.

8) *Lack of marten habitat*: The latest spruce budworm infestation, which killed much of the balsam fir component of the BSF, and past harvesting practices, including the application of the *Timber Management Guidelines for the Provision of Moose Habitat*, have resulted in a lack of marten habitat.

9) *Revitalization*: Due to the latest spruce budworm event, historic forest management practices, and fire suppression, some BSF stands have poor stocking and low volumes and need revitalization or special management considerations. Merchantable volumes are reduced in many of these stands and, in some cases, harvesting is not economical. Also, many of these stands have highly competitive shrub and herbaceous layers. Often, these areas generate low renewal revenues, but require large expenditures to renew the desired forest condition.

10) *Uneven-aged stands*: Historic harvesting of the BSF mainly removed conifer species and veneer-grade hardwoods. Retaining hardwoods has resulted in the current preponderance of uneven-aged stands on the BSF. Historic "high-grading" has led to a prevalence of uneven-aged stands in the Main Parcel that are not captured in the FRI.

11) *Environmental practices*: The 2001 IFA (Callaghan and Associates Inc. 2001) made several recommendations related to improving environmental practices on the BSF. Bowater is required by their SFL, the CFSA, and their own Environmental

Management System (EMS) to minimize negative environmental impacts caused by forest operations on the BSF.

12) *Old growth*: New old growth policy, definitions, and direction exist for Ontario's Crown forests to help Bowater maintain and enhance old growth on the BSF.

13) *Caribou*: It is well-documented that caribou use many of Lake Nipigon's islands. Recently, caribou have been traveling to new mainland areas. It is not well-understood how and why the caribou use the mainland areas.

14) *Moose populations*: The latest spruce budworm infestation has likely led to a lack of late winter moose habitat, although moose population objectives are currently being met.

15) *Ontario Living Legacy*: The 2001 FMP had to address land use decisions that resulted from on-going OLL initiatives.

16) *Hardwood utilization*: In previous plans, the majority of birch and poplar species on the BSF have been allocated but not fully utilized.

17) *Red and white pine*: Historically, the BSF had higher levels of red and white pine species than are currently on the Forest.

18) *Leave blocks*: Respecting leave block boundaries within allocated stands was identified in the 1996 IFA as an issue.

19) *Discontiguous landbase*: The four distinct areas of the BSF are geographically separated. This in itself creates some inefficiency. This inefficiency is compounded by OMNR's two district, three LCC, multiple staff overseeing of the BSF.

3.0 SUMMARY OF AUDIT FINDINGS

3.1 Commitment

Within the audit, commitment is assessed in terms of the existence of policy documents that provide a vision and mission to the forest management organization, while giving long-term guidance to the management of the organization. Commitment must also be evident in the day-to-day operations of the organization.

Bowater has an Environmental and Sustainable Forest Management Policy that addresses its commitment to sustainable management and has communicated this policy to its employees and contractors. The policy meets the requirements of both the International Organization for Standardization (ISO) 14001 and Sustainable Forestry Initiative (SFI)

standards. The policy statements were not explicitly visible on site during the audit, but were found within the corporate vision statements (http://www.bowater.ca/envDocumentation.aspx).

The Company's commitment is refined through third party verification to the ISO 14001 and SFI standards. It is not uncommon for Ontario forest companies to maintain an ISO 14001 certification, but Bowater was among the first companies in Ontario to have its Crown forests certified to SFI standards. Staff awareness of its environmental policies and certification standards is high.

Tangible evidence of Company commitment beyond the requirements of regulation was evident throughout the audit. The Bowater staff working on the BSF have all been working for the Company in excess of 20 years and have a solid understanding of the origins of most forest regulations in Ontario. Bowater has a history of bringing innovative approaches to forest planning. For example, the Company used a new planning program, Forest Simulation and Optimization System (FSOS), for the 2001 FMP. Innovation is almost always difficult to fit into Ontario's prescriptive planning system, and the Company has rarely been successful at changing approaches. That notwithstanding, the Company's independent approach to many issues is interesting evidence of the Company's commitment to the Forest.

OMNR has a number of initiatives that are directly related to forest management. These include: *MNR's Class Environmental Assessment Approval for Forest Management on Crown Lands in Ontario*, the *Old Growth Policy for Ontario's Crown Forests* (OMNR 2003), and the *Forest Management Guide for Natural Disturbance Pattern Emulation* (NDPEG) (OMNR 2001a); implementation of the *Forest Information Manual* (FIM) (OMNR 2001b); the ongoing creation, revision, and implementation of other resource management guidelines; and the regulation of protected areas through the OLL initiative. Ongoing implementation of these policies and guidelines are very important to maintaining the policy framework, and more importantly, to sustainable forest management. From the audit team's discussions with staff at all levels within the Thunder Bay District, and with selected staff within the Nipigon District, it was apparent that staff are familiar with corporate policies and guidelines and are committed to carrying out OMNR's mandate.

3.2 Public Participation

Forest management in Ontario is intended to be carried out in an open and consultative manner. The general public has access to FMPs, annual work schedules (AWSs), annual reports, and a legal process for requesting specific consideration of their concerns during the creation of new FMPs. The public is to be represented by an LCC that is appointed by the District Manager, as required by the 1994 Class Environmental Assessment decision, and, subsequently, enshrined in the CFSA of that same year. The LCC is formally involved in reviewing plans for crown forests and, in many cases, contributes directly and

meaningfully to determining the strategic directions that guide the overall planning process.

3.2.1 Local Citizens' Committee

The BSF is unique in Ontario in that three LCCs (Nipigon West, Lakehead, and Armstrong) have been formally involved in its planning and operations. One advisory committee (the Lake Nipigon Watershed Advisory Committee) has exchanged information with planners on the BSF for 10 years. Despite the large number of committees involved in the BSF, public participation and interest is low. All three of the LCCs have other forests that are of higher priority and interest to them.

While only the Nipigon West LCC was evaluated with respect to the IFAPP, interviews were offered to members of all the LCCs. Six interviews were held with Armstrong LCC members, seven interviews were held with Lakehead LCC members, and five interviews were held with members of the Nipigon West LCC. The involvement of all three of the LCCs is a result of the geography of the Forest and boundaries between the Nipigon and Thunder Bay Districts. The Current River and North Parcels of the BSF are located within the Thunder Bay District and should generally be of greatest interest to the Lakehead LCC. The Caribou East Parcel is on the western edge of the Armstrong Forest and is, therefore, closest to the Armstrong LCC. The remaining parcel is within Nipigon District and is, therefore, within the geographic boundaries of the Nipigon West LCC. The fragmented and dispersed nature of the Forest, together with its distance from many communities, has meant that it receives considered attention from only a few LCC members. The most logical community of interest with respect to the BSF is KZA or Gull Bay. The Reserve is surrounded by the BSF and, therefore, community members should and have expressed a strong interest in it.

Some LCC members expressed concern that dealing with the BSF was not a good use of their time because it was too distant from their interests. A couple of members were not sure it was looked at by their LCC. Many members questioned whether this was the most efficient organization and structure, both with respect to the Forest's boundaries and LCC division of responsibilities. At the very least, it is hard to get public feedback when few LCC members have an interest in or understanding of the Forest.

As the Nipigon West LCC is the lead LCC and the BSF makes up a significant portion of the landbase that they cover, it would be advantageous to have more members with an active interest in the Forest. As well, it would be advantageous to the mix of the LCC if First Nations members, and specifically individuals from KZA (residents or non-residents), were involved in the LCC.

Recommendation 1: District OMNR shall intensify efforts to recruit new Local Citizens' Committee members with an interest in the Black Sturgeon Forest and, if possible, members from Kiashke Zaaging Anishinaabek.

The Nipigon West LCC Terms of Reference does not reflect the 2004 Forest Management Planning Manual (FMPM) (OMNR 2004) requirements and needs to be updated. The specific requirements for the Terms of Reference are outlined in Section 3.2.4 of the FMPM. Many of the specific sections of the Terms of Reference need updating including: Purpose of the Committee; Membership and Organization; and Responsibilities (including reporting responsibilities). Either the Terms of Reference should be updated or a new Terms of Reference should be written.

Recommendation 2: District OMNR shall revise or write a new Local Citizens' Committee Terms of Reference to reflect the 2004 Forest Management Planning Manual requirements.

The Black Sturgeon planning team has also been asked by a fourth citizens advisory committee, the Lake Nipigon Watershed Advisory Committee, to address their concerns on occasion. The auditors note that watershed advisory committees are not recognized by the 2004 FMPM, therefore, there is no requirement for the planning team to meet specifically with this committee. Between the FMP consultation process and the existing LCCs (of which the Watershed Advisory Committee could seek membership), there are ample opportunities for public input.

Along with comments regarding the geographical dispersion and administrative structure of the BSF, LCC members also raised the following concerns: access management into the Caribou block; cutting in riparian areas; the need for more intensive forest management; the development of more value added products from a more diverse species base; identification of minor species for use by local entrepreneurs; utilization; and sustainability of the forest resource and the industry. Also, the Armstrong LCC members wondered if the Caribou Parcel could be consolidated into the Armstrong Forest or be given to the local Armstrong community or First Nation for management.

The unfocussed nature of the LCCs with respect to the BSF is largely an artefact of the disjointed geography and administration of the Forest. In section 3.8 of this report, *Contractual Obligations*, the auditors have repeated recommendations from previous audits that the BSF be consolidated administratively and geographically. Currently, the three LCCs and the BSF are inefficiently served by the fragmented approach to managing this forest. The audit team recommends the District Managers of the Thunder Bay and Nipigon Districts consolidate this effort into one focused LCC.

Recommendation 3: The District Managers of the Thunder Bay and Nipigon Districts shall create a consolidated Local Citizens' Committee focused on activities on the Black Sturgeon Forest.

3.2.2 FMP Standard Public Consultation Process

The audit protocol has four criteria relating to the FMP public consultation process. The Company and OMNR met their obligations on all of them.

All five stages of the public consultation process were advertised in local newspapers (i.e., Thunder Bay Chronicle Journal, Nipigon Red Rock Gazette and Thunder Bay Source). An up-to-date mailing list was used to directly contact interested parties. The list included more than 600 individuals and institutions. The planning process met all requirements to consult with the public and ensure that interested members of the public had sufficient opportunity to observe and comment on both the 2001 and 2006 FMPs as they were being developed.

One negative comment was received during the consultation process regarding problems with the clarity or comprehensibility of information provided to the public. This is a lower than normal number of complaints about the open house process.

Opportunities for invoking the Issue Resolution and the Individual Environmental Assessment processes were properly communicated. Three Environmental Assessment bump-ups were registered against the 2006 FMP.

3.2.3 Native Peoples' Consultation

Historically, Lake Nipigon's size and resources meant that it was an important area for Aboriginal people. As such, a large number of First Nations have a presence on and connection to the Lake. As the BSF occupies significant land areas adjacent to Lake Nipigon, it is not surprising that there are a large number of First Nations and Aboriginal people with a connection to it.

Seven First Nations and three Aboriginal communities were contacted during the audit to determine their interests in the BSF. Interviews were held with four First Nations (KZA, FWFN, Whitesand First Nation and Sand Point First Nation) who responded. The formal offer for the native consultation process for the 2006-2026 BSF FMP was made initially to: Sand Point First Nation, BZA (Rocky Bay) First Nation, KZA (Gull Bay) First Nation, Whitesand First Nation, Red Rock Indian Band, and FWFN. During the FMP process, the community of Namaygoosisagagun (Collins), which is not recognized by Indian and Northern Affairs Canada, also requested in writing to participate in the FMP process. This was granted by the Nipigon District Manager. It should also be noted that Animbiigoo Zaagi'gan Anishinaabek First Nation (formerly the Lake Nipigon Ojibway), the unrecognized Poplar Point Ojibway Nation community, and the unrecognized Poplar Point community also received mailings for the BSF. The former two indicated to the audit team that they do not have any interests on the Forest, and the latter did not respond to inquiries.

Of the large number of First Nations and Aboriginal communities potentially associated with the BSF, the location of the KZA Reserve (i.e., surrounded by the BSF) means that the BSF is of great interest to the community. Along with the Forest's overall significance to the people of KZA, it is also the major operating area for Niigaani Enterprises Inc., a company that is owned by and employs many Gull Bay residents. The BSF is also important for trapping and silvicultural economic activities. Using OMNR-

provided funds, the KZA First Nation contracted the Aboriginal Strategy Group to collect and identify native values on the BSF for the 2006-2026 FMP. Values on other forests were collected as well. The native values map that KZA provided included: community and individual trap lines, traditional areas, community and reserve boundaries, areas to collect fuelwood and plants, and sites of archaeological, historical and spiritual significance. The community was pleased with the exercise. Gull Bay representatives participated on the planning team.

Aboriginal Strategy Group also prepared the Native Background Information Report for Sand Point First Nation. No native values maps were prepared for the BSF for Sand Point, as they are not aware of any values on the landbase. BZA (Rocky Bay) participated on the planning team and an open house was held at the community. Reportedly, a values map for the community has been developed, but was being withheld due to concerns about disclosure. It is unclear whether there are any values on the BSF or whether these are restricted to the Nipigon Forest. Both Sand Point and BZA are located some distance from the BSF and it is unclear whether there are any specific values or interests in the BSF. The Red Rock Indian Band did not participate in the BSF FMP process.

In a discussion held with Whitesand First Nation, it was identified that they have values in the Caribou East Parcel landbase. These values are already mapped and their values map is in a draft final stage. These values were shared with Bowater during preparations for the 2001 FMP, but were not shown to OMNR. Nothing was provided during the 2006 FMP process. It should be a priority that these values be protected as soon as possible. Whitesand First Nation, which normally deals with the Armstrong Forest through the Thunder Bay District, was unclear about the administrative structure of the BSF and that the Nipigon District was the lead.

Recommendation 4: District OMNR shall review tending and renewal planned for the 2006 forest management plan in the Caribou East Parcel against Whitesand First Nation values.

OMNR Nipigon and Thunder Bay Districts have conducted negotiations with local First Nations on economic opportunities. It should be noted that the First Nations with economic interests are not focused specifically on the BSF, but are rather seeking economic opportunities across several management units.

The largest Aboriginal enterprise currently operating in the Forest is Niigaani Enterprises Inc., a native-owned logging company. Niigaani Enterprises Inc. harvests close to 200,000 m^3 for Bowater on the BSF. Niigaani Enterprises Inc. is also involved in tree planting and other silvicultural work on the BSF, as is KZA.

The Chief of KZA indicated that he is interested in seeing more opportunities with the forest sector over time and, possibly, through a regional economic development corporation, Chi-Neebah, that has been recently established by a number of local First

Nations. The opportunities do not have to be in logging, but he would like to see more opportunities, possibly in value-added work, silviculture, and fire management.

The FWFN expressed interest in obtaining a birch allocation in the Thunder Bay and Nipigon Districts. FWFN's interest in the birch has been known to OMNR for approximately two years. FWFN's current concept is for a birch merchandising facility to deliver birch to other users, and for residual birch to be used in some type of co-generation facility. FWFN expressed their dissatisfaction with the OMNR's failure to deliver tangible benefits to them through Condition #34 (formerly known as #77). The volume desired for the facility is significant and well beyond the supply available in any one forest, although the BSF would likely be one source of the supply. As most of the birch volume in the Thunder Bay and Nipigon Districts was committed to Buchanan Forest Products Ltd., OMNR has previously stated that they could not merely re-allocate that volume. Furthermore, the volume desired by FWFN was far more significant than the non-allocated birch in the Districts.

There are a number of challenges associated with Condition #34, not the least of which is that one of the few mechanisms OMNR has to create economic opportunities for First Nations is by granting non-assigned volume allocations to them. Unfortunately, since the implementation of Term and Condition #77, the vast majority of wood in the Province had already been allocated, resulting in only minor volumes of less desirable species being available for OMNR to direct to First Nations. OMNR was therefore stuck between the legal supply commitments to forest products industries and the Term and Condition of the Environmental Assessment Board (and First Nations desires) that identified that First Nations should be given more economic opportunities. The result of this conundrum is that OMNR has rightly explained that they have a very limited number of tools to address the problem and, at the same time, some First Nations complain that the few opportunities that were trickling to them were of a minor nature. Neither party was wrong in their assertions.

Recently, events in northwestern Ontario have occurred that has resulted in Buchanan Forest Products Ltd. surrendering the majority of their birch allocation in Thunder Bay and Nipigon Districts and, therefore, potentially freeing up the birch for other potential users, including FWFN. While the OMNR believes it must go through a competitive tender process and cannot simply allocate the volume to FWFN, the request for proposal process does recognize in the evaluation scheme the importance of First Nations involvement/leadership in the proposal. In essence, the OMNR is using one of the few tools at its disposal to potentially create an opportunity for First Nations. This does not guarantee an opportunity for FWFN, but is in keeping with the spirit of the condition.

At a time when the forest industry is undergoing a structural adjustment in the Province that is likely to result in changes to allocations, more opportunities for First Nations alone or in partnerships with industry could potentially occur. These opportunities could be realized if the OMNR is proactive in its future allocation deliberations. The current Condition #34 Guidelines should be updated to ensure that this opportunity is not lost. Many First Nations and Aboriginal peoples, including FWFN, are frustrated by what they

see as the lack of results from Condition #34 and it is, therefore, important to ensure all mechanisms are in place to realize these opportunities.

Recommendation 5: Corporate OMNR shall revise Condition #34 Guidelines to ensure that all re-allocations of timber have regard for First Nations economic opportunities.

Whitesand First Nation has indicated an interest in silvicultural opportunities between Armstrong and Thunder Bay, provided they are not competing with other First Nations contractors. They have sporadically worked for Bowater on the BSF.

Sand Point First Nation has indicated an interest in obtaining a cedar allocation, although it is unclear whether the BSF would be a source of this fibre. OMNR has asked them to prepare a business plan before considering this.

3.2.4 Annual Work Schedule Public Inspection

An assessment of the various public notifications and direct mailings that are required prior to the implementation of annual operations revealed that all of the requirements are being fulfilled. Notification advertisements for the aerial spray programs are being placed in the local newspapers, as required. Bowater and OMNR have been diligent in responding to the public's requests for further information.

3.3 Forest Management Planning

Forest management planning is the foundation for the sustainable use of Ontario's forests. This audit reviewed both the 2001 and the 2006 FMPs. The 2001 and 2006 FMPs were prepared in accordance with the 1996 FMPM (OMNR 1996a). The audit team focused its field inspections on the implementation the 2001 plan. The auditors focussed its review of planning team activities on the 2006 FMP.

3.3.1 Planning Team Activities

The 2001 and 2006 FMPs were produced by planning teams established two years prior to plan approval. Each plan's terms of reference was prepared and approved according to the requirements of the 1996 FMPM.

The number planning team members and advisors is onerous, due to the multiple OMNR districts and areas involved. The planning team for the 2006 FMP had fifteen members, which in itself is reasonable. However, the plan lists some 47 advisors, 34 LCC members, and 25 reviewers. The auditors are impressed that the 2006 plan proceeded as smoothly as it did, but, as has been noted in previous audits and elsewhere in this audit, the administrative complexity of the BSF is burdensome. Protocols were developed to

deal with jurisdictional issues within OMNR, and this measure allowed the process to be completed. However, this must be streamlined, not only to save the time and expense of managing a process that is unnecessarily complex, but also to improve the credibility of the planning process. Section 3.8 of this report has a recommendation to amend the current management structure and this comment is offered as additional support for that.

The background information provided to the planning teams for both the 2001 and 2006 plans was adequate. The timely delivery of values information posed significant challenges throughout 2001 FMP production. At the start of the process, values for significant portions of the BSF were not available (i.e., Current River, North Sturgeon, and Caribou East Parcels). OMNR did collect the necessary values information once the issue was raised, however, NRVIS was incapable of producing a consistent product. Values information was often missing from the maps and the digital transfer of this information to Bowater required significant remedial work by Company geographic information system (GIS) staff to make it functional. This is further discussed in Section 3.3.5 of this report.

The planning teams for both the 2001 and 2006 FMPs were staffed with the appropriate professional and technical staff. The planning team chair in both instances was a professional forester, recognized by the Province of Ontario. The plan author for the 2006 FMP was a consultant rather than a Company staff member. The 2006 planning team performed professionally throughout the process, despite several staff changes among OMNR area foresters. The 2006 team was able to address contentious decisions such as wood allocation, marten core shortfalls, caribou issues, and a major deferral after the second information centre.

Timelines were set appropriately in the terms of reference for both plans. Actual timelines were in general agreement with the terms of reference, and both plans were prepared and approved on time. The planning team minutes were clear and transparent to outside readers. The minutes from both plans provided good overviews of the development of the plans through to the final meetings.

3.3.2 Resource Stewardship Agreements

Resource Stewardship Agreements (RSA) are voluntary agreements between SFLs and resource-based tourism establishment licensees in Ontario. Although the agreements are outside the scope of this audit, there are a number of indicators that relate to it. The Company followed the procedure required in the FMPM; primarily this relates to contacting potential tourism businesses identified by the Ministry of Tourism and offering RSAs. The Company took the RSA process seriously and sees the value of business-to-business agreements for addressing potential problems. The commitment to maintaining remoteness is provided in the 2006 plan. There was one RSA negotiated and signed. Most outfitters are not affected by harvest operations at this time and, because there is reasonable trust that the AOC planning process addresses their concerns, have not pursued formal RSAs. The Company was very encouraging in their approach to the

outfitters, seeing the RSA process as a genuine mechanism to give the forest company and tourism companies a mutual understanding in a formalized manner.

In the AOC field examinations, several road removals were checked for the protection of tourism values. These were thoroughly implemented, supporting the observation that outfitters seem to trust the AOC process.

3.3.3 Source of Direction

Plan preparation must be done in the context of many higher-level land use and policy documents. The auditors reviewed both the 2001 and 2006 plans and the AWSs from 2001-2006, to ensure that proper consideration had been given to the overriding guides. Overall, direction is appropriate, although there are some individual recommendations made in this report to address small inconsistencies.

A review of the planning team minutes confirmed the guides and policies that were used as sources of direction for the production of the 2001 and 2006 FMPs. FMP text indicates that Provincial guidelines and regional and district land use guidelines were used for the 2001 FMP, while the Crown Land Use Policy Atlas was used for the 2006 FMP.

The auditors' review of the AWSs confirmed that guide requirements, AOC prescriptions, and stand level requirements are being properly documented and carried forward from the FMP. Field observations confirmed that performance was within normal operating standards and met the requirements of the directly relevant guidance documents.

3.3.4 Introduction

Introductory sections of the 2001 and 2006 FMPs contain the mandatory Statement of Environmental Values (SEV) briefing note, which is prepared by OMNR, and the index of the environmental components of the plan. Both documents follow the conventional approach and meet the requirements of the planning process.

3.3.5 Management Unit Description

The historic forest condition is well described in both plans. Differences between the parcels are described and the implications for management are discussed. The 2006 plan has historic harvest maps, which show the cut radiating out from water bodies and courses. The 2001 description is more detailed and easier to read and understand, but both effectively present the required information.

The FRI used to develop the plans is described. The inventory was updated for both plans. Updates took into account depletions, accruals, and forecast depletions until the end of the plan term.

In the 2001 plan, there was considerable confusion surrounding the forest landbase listed in the various tables. These problems have been corrected for the new plan. The forest description in the 2001 FMP contains all the required parameters. Plan text clearly and succinctly describes and explains these parameters. Likewise, the 2006 plan's forest description accurately and completely reported on the current forest conditions. In many cases, there was little or no change in the indicators for the two plans.

Reviewing information describing other resources dependent on forest cover is an important part of the audit. The information describing public values, local featured species, and rare species is assessed, as is the use of this information in the plan. The FMP document accurately describes the challenges regarding key species, focussing on caribou, marten, and moose. The adequacy of the information required for plan preparation was reviewed.

Caribou is the highest profile species on the unit, and the local biologists have made exceptional efforts to characterize its habitat. Radio collaring of caribou is technically and physically challenging, and a small program has been established locally. This has contributed to a better understanding of the caribou use of the forest. One survey was flown in conjunction with the moose aquatic inventory, in an attempt to establish caribou distribution. In spite of this effort, the current knowledge of caribou habitat use is insufficient.

As one consequence, harvest operations are being deferred until sufficient information is available. The forest industry is politely but decidedly concerned about the gathering of values information for caribou, which did require changes late in the planning process. There is a need for more timely information for this particular value. The local effort was impressive; OMNR's corporate commitment to collecting caribou information in this part of Ontario is small.

Another consideration in the values discussion is the move to 10-year planning. Typically, OMNR funds special values collection surveys prior to planning taking place. In a 10-year cycle, the timing may be a problem if there is a shift in moose, deer, and caribou distribution and abundance over the decade. The 2006 plan specifically commits to "Additional work …required to further understand the use and importance of this area for caribou." Information collection requires an appropriate level of effort.

Recommendation 6: Corporate OMNR shall assist local efforts to improve caribou habitat use information, including seasonal habitat use and habitat supply in the vicinity of Lake Nipigon, the Islands of Lake Nipigon, and surrounding SFL areas.

Other ungulates in the forest are equally important economically and ecologically. Moose provide recreation and tourism benefits. Moose habitat requires considerable

modification of harvest operations and timing, so accurate habitat use information is important. Regular surveys of moose aquatic feeding areas and winter concentration areas are performed, to provide information for planning. Anecdotally, several occurrences of moose were observed in upland habitat reserves during the extensive audit field tour. Deer are increasing in abundance and may be expanding their range north. The significance of this is the possible spread of "brain worm," which could have a serious impact on moose and caribou. Anecdotal information indicates the disease is increasing in Ontario following a recent increase in the deer population.

It is important for social, economic, and ecological reasons to manage habitat for ungulates in a coordinated manner through the FMP. In the current plan, the FMP objectives empower the biologists, during planning, to provide guidance for moose habitat management at the stand level, through corridors and winter areas. There is no requirement to manage for deer habitat. Caribou management, as discussed above, requires additional information

The role of the objectives in both the 2001 and 2006 plans is discussed here because, although it relates to several other aspects of the IFAPP, it concerns information collection and the overall assessment of values. The FMP was helpful in describing the difficulties OMNR had in using the FSOS model preferred by the Company for habitat suitability assessments. The role of the Strategic Forest Management Model (SFMM) was explained.

Difficulties caused by the change in forest units from the 2001 to 2006 plan were described. The FMP concluded: "…No meaningful conclusions can be drawn from [Table] FMP-5 regarding changes in habitat at the eco-regional level between the plan terms." Evaluation of wildlife objectives is compromised because of this. They are compromised before the plan because habitat suitability (2006 plan) is not clearly analysed, and after the plan because objective achievement is not assessed (2001 plan). Both of these problems arose through changes to the planning system, which will not be discussed here. The consequence is that there are few options for making audit recommendations other than respecting the objective setting and evaluation process. Ironically, the struggle to improve the FMP process is interfering with the implementation and assessment of the plans. There is no meaningful recommendation that seems appropriate for this higher-level issue.

Information management is integral to the availability and quality of information. The planning team and the FMP were singularly critical of the problems caused by the difficulty in getting values information to the planning team. Our interviews with field staff confirmed that this was a significant problem. Some brief quotes from the 2006 plan are provided to illustrate the problems:

- "…timely delivery of this values information posed significant challenges"
- "…values were often incorrect."
- "Values information was often missing from the maps and the digital transfer of this information to Bowater for use on its GIS required significant remedial work by company"

- "...differing map projections used by MNR and Bowater was one of the hurdles"
- "the 'one-window' information provision system is not working effectively."

The source of the problems seems to have been the Land Information Ontario warehouse corporately administered by OMNR, and the following recommendation is directed there.

Recommendation 7: Corporate OMNR shall correct problems related to values information delivery to planning teams.

Thermal regimes and fish inventory information, as in adjacent forests, is not adequate. This is a well-known problem. In the 2001 plan, significant commitment to utilize wood in riparian corridors was foregone because adequate thermal information was not available, nor was critical habitat information or trout stream information, particularly in the southern portion of the unit. This also influences the ability to implement shoreline prescriptions and natural pattern emulation. The 2006 plan states: "Owing to provincial fiscal constraints on collecting critical values information, the majority of streams have not been adequately classified on the BSF. This has resulted in the categorization of most streams as 'unknown', which applies the same restrictions as those placed upon cold water streams, and the application of more extensive timing restrictions and wider aerial herbicide buffers along these streams. In many cases these buffers and timing restrictions may be overly protective." Stream and water body inventory would be required once, but would provide long-term benefits. The information is essential for management of both the aquatic and riparian resource.

Recommendation 8: OMNR shall adequately fund and then collect fish habitat values information. At a minimum, values must be documented prior to the beginning of harvest operations.

Section 2.3.3 of the 2006 FMP provides a social and economic description of the forest. The description included all the information required by the 1996 FMPM and included demographics, economic environment, and investment intention for both industrial and non-industrial uses. The summary of the various mills that receive wood from the forest was comprehensive and insightful, particularly regarding information on investment intention and spending. The non-industrial description of the forest was also good. In particular, there was some detailed quantitative information on tourism that is not often found in other plans.

The Ontario Federation of Anglers and Hunters (OFAH) provided supplementary information to OMNR on the economic impact of crown land hunting, specifically moose, deer, and bear hunting. While the effort by the OFAH was commendable, there are several questions regarding the results. The term "wealth created" is used as some sort of proxy to total economic impact, although this is not explained in the results and not properly referenced. Information was taken from work in the French Severn Forest, but there is no indication whether this involved primary research. There have been other economic studies on large game hunting done that are likely more valid for use in a

benefits transfer exercise. Lastly, the study equates the total number of tag applications in the unit to the estimated number of hunters. The actual number of hunters may not be directly related to the number of applications. Nevertheless, the information provided by the OFAH was additional information and it would not be too difficult to verify some of the analysis. The plan authors correctly noted that there might be some concerns with the analysis.

Community demographic and economic profiles were provided in Appendix 6 of the 2006 FMP. This included community profiles developed by the MNDM and District profiles prepared by the OMNR. It was a useful exercise to add this information. The Socio-Economic Impact Model (SEIM) is used to assess the socio-economic impact of the various management alternatives. In turn, that analysis is used by the planning team, the LCC, and the public to rank the various management alternatives. In the case of the 2006 BSF FMP, the input to the model was incorrect and, therefore, the results were likely five to six times greater than actual impacts. For example, the FMP identified that the preferred alternative would result in 2,276 jobs a year for the period 2006-2011, contribute $602,017,000 to the local economy of northwestern Ontario during the 2006-2011 planning term, and contribute $201,896,000 in revenues to all levels of government. The output for the Spruce River Forest, which has a roughly similar yearly wood supply, showed that the chosen alternative would result in 736.6 jobs a year and approximately $52,500,000 of revenue to all levels of government. It would appear that the discrepancy was likely a result of the activity inputs used (e.g., silvicultural expenditure and volumes of wood to be available) in the model run. Either they were incorrect to begin with or incorrect given the model's handling of time. Since this was done for all the management alternatives and the single most important short-term driver in the model's output is volume of wood to be cut, it is unlikely that this affected the ranking of alternatives by the team or public. Nevertheless, the output from the model was reported in the 2006 plan and, if actually intelligible to anyone, would be highly misleading. The auditors suggest that if the SEIM is to be included as part of the FMP process, plan authors should ensure that the conclusions of the model are reasonable.

Suggestion 1: FMP authors should ensure that the Socio-Economic Impact Model (SEIM) outputs are reasonable and relevant before relying on them as a planning tool.

3.3.6 Objectives and Strategies/Management Alternatives

The objectives for the 2001 and 2006 FMPs were prepared in accordance with the requirements of the 1996 FMPM and address the four broad categories as required by the CFSA, namely, forest diversity, social and economic matters, provision for forest cover, and silviculture.

The 2001 plan had 22 objectives while the 2006 FMP had 19. The reduction in the number of objectives was due to the consolidation of some of the socio-economic objectives and the expansion of the biodiversity objectives. Each objective has strategies

and targets associated with it. The majority of the targets are not measurable within the planning cycle.

Both plans identify a range of issues that will affect management. Many of the issues are common to both plans, such as inadequate values information, underutilization of the allowable cut, and a lack of marten habitat. The values and poor utilization issues date back to the 1996 plan. Little progress towards resolving these issues is evident.

Seven management alternatives were presented in the 2001 plan and analysed by the planning team. These alternatives covered a reasonable set of objectives and strategies. The three mandatory alternatives were modelled and analysed according to the 1996 FMPM. The 2006 management plan presents four management alternatives, though a wider array of scenarios was examined during the search for a sustainable management alternative acceptable to all parties.

Each management alternative was analyzed to identify the future forest condition that is expected to result from its implementation and the implications of the management alternative in terms of its ability to ensure forest sustainability and produce the desired benefits or outcomes over time. The analysis included an initial test of sustainability for each management alternative through the use of the non-spatial indicators of forest sustainability criteria (i.e., forest diversity indicators, managed Crown forest available for timber production, available harvest area and percentage actually utilized, and, finally, habitat for selected wildlife species). Those management alternatives that passed the initial test of forest sustainability were then assessed for their ability to achieve desired management objective targets over time. All management alternatives were shown to the public during two Information Centres and public review periods. The management alternatives were also presented to the LCC for review, comment and, finally, endorsement. All management alternatives were considered to be acceptable by the public.

Model inputs and assumptions for the 2001 plan were appropriately developed and documented using the available information. The available landbase was somewhat inflated, as recently burned areas were included in the 1-20 year age class when they may have been more appropriately classified as B&S. This was an object of criticism in the previous audit.

The 2006 management plan used the FSOS model, which is a spatial wood supply model, along with SFMM. Similar results were achieved with both models. An excellent analysis was provided with the FSOS results. Problems encountered in the 2001 plan were corrected in the 2006 plan.

A forecast of long-term sustainability of forest conditions and wildlife habitat was achieved in the selected management alternative. Timber supply sustainability was achieved, although the medium term supply is anticipated to decline before recovering after year 50. Much of the decline is the result of age class imbalances on the forest and the impact of natural disturbances from both fire and spruce budworm.
The planning teams for the 2001 and 2006 plans did the appropriate examination and

analysis of the SEIM results, although, as noted earlier, the model did not appear to have been run correctly for the 2006 plan. The auditors believe the error in running the SEIM did not invalidate the final selection of a management alternative.

The rationale for the selected management alternative in the 2001 and 2006 plans was clear and logical. Both plans identified the ranking of each alternative in relation to each objective. The plans discuss the tradeoffs between the various alternatives.

In the 2001 and 2006 plans, the availa harvest area from Table FMP-18 (*Forecast of Harvest Area*) corresponds with the results generated by SFMM for the selected management alternative. No primary roads were proposed or planned for in the 2001 or 2006 plans. Eligibility criteria identified in both plans were consistent with the objectives and strategies.

3.3.7 Operational Planning

Operational planning includes the allocation of areas for operations, the layout of harvest areas, the planning of forest access, and the development of AOC prescriptions. An AOC is the technical planning term for a forest value that has had a detailed prescription developed to protect it from potential adverse impacts of forest management operations. Normally, an AOC is protected through a prescription outlined in specific management guidelines appropriate to the value. Forest values information is collected and maintained in a digital format by the OMNR in their NRVIS.

The Company and OMNR created an innovative groundwater prescription for brook trout watersheds. Groundwater recharge zones are critical for maintaining brook trout spawning habitat. The AOC prescription was modified to avoid forest harvest activities that promote compaction of the soil and potentially reduce water flow in these recharge zones. This is beyond the normal water quality AOC prescription. This proactive addressing of a potential Fisheries Act "harm ful alteration, disruption or destruction (HADD)" is a good example of an adaptive use of the AOC process. Overall, the audit team found prescriptions are appropriately assigned.

The 2006 plan received three bump-up requests. One was related to a trap line AOC. The Ontario Ministry of the Environment (MOE) has not yet made a determination on any of these requests.

Biologists interviewed during the audit were frank in agreeing that there were some problems with the review of specific prescriptions for the 2001 plan. This was rectified to some extent for the 2006 plan. There was evidence that the biologists reviewing the plans had differing views. There is no doubt that there is greater expertise brought to bare when there are more individual biologists considering an activity, although it did appear to cause delays in the review process. This is further evidence of the challenge of the administration of the BSF.

There was a problem that arose due to changes in wildlife habitat definitions from the 2001 plan. The last comparisons were frankly referred to in the 2001 FMP as "…highly unlikely changes in amounts of preferred habitat between this plan and the previous plan….". Some difficulties have arisen as the wildlife habitat matrixes are being developed. A recommendation has been included to address the need for consistency in long-term monitoring. The auditors are aware of the difficulties in developing wildlife measures and appreciate the excellent work that has been invested in establishing baseline information up until now.

Recommendation 9: Corporate OMNR shall ensure that changes to habitat definitions do not affect the ability of planning teams and others to compare the outcomes of habitat management for wildlife indicators.

White-tailed deer have obtained a higher profile in the region due to a series of mild winters. However, there are no management objectives or strategies tailored specifically to deer, as the BSF is considered to be more suitable to moose and caribou. The empirical observations of biologists that deer are likely wintering farther north, away from Lake Superior, should be confirmed. OMNR has initiated a deer season in one WMU (WMU 15B) in response to the increase in deer populations. Deer population increases should be quantified and deer management objectives that are integrated with those for moose and caribou should be completed.

Suggestion 2: District OMNR should quantify the encroachment of deer into traditional moose and caribou habitat. If populations are established, objectives for deer, moose, and caribou should be coordinated.

Silvicultural ground rules (SGRs) were developed in the 2001 and 2006 plans. Table FMP-10 (*Silvicultural Ground Rules*) was completed appropriately with prescriptions being in line with the appropriate guides. One prescription was written for harvesting on shallow soils using full tree harvest systems that was an exception in the SGRs. A regional monitoring system was in place for this harvest system.

Selection criteria for operating areas were consistent with the eligibility criteria in the selected management alternatives. Separate criteria were developed for harvest, renewal, and tending activities. Clear rationale was provided for each.

Selected harvest areas were consistent with the areas generated in the selected management alternative. Overall there was a 3% difference between the actual allocations and those generated by the models. Planned harvest areas differed from the available areas on an age class basis for each forest unit, due to constraints placed on the forest by the application of various wildlife habitat guidelines (e.g., caribou and moose). Overall the substitution does not impair forest sustainability.

Harvest depletions were accurately forecast and planned for in the 2001 plan. Tables were adequately and accurately produced. Wood supply commitments in the 2001 and 2006 plans were documented and addressed. All directives were addressed.

Forecasts for renewal, tending, and support were prepared according to the requirements of the 1996 FMPM for both the 2001 and 2006 FMPs. The levels of activity were consistent with those needed to achieve objectives and ensure continued forest sustainability. Renewal support for planned activities was adequate.

Access planning was fully and professionally developed and presented in the plan. Access planning on the Forest is consistent with short- and long-term objectives for the Forest. Documentation both in the 2006 plan and supplementary documentation met the requirements of the 1996 FMPM.

The plans contained revenue and expenditure forecasts in Table FMP-27 (*Forecast of Revenues and Expenditures*). All rates were clearly explained and any assumptions were discussed. Separate estimates of salvage operations were presented. The levels presented in the plans were consistent with the models and forecasts in the plan.

The 2006 FMP includes a discussion of the monitoring programs to be implemented over the five-year term of the plan. Forest operations, regeneration success, FTG, and AOC monitoring are all addressed.

Both the 2001 and 2006 plans contain a summary of the results of audits. The 2006 plan has incorporated the changes requested in the 2001 audit.

3.3.8 Plan Review and Approval

Both plans were submitted for review on time. The OMNR review was completed effectively. A preliminary list of alterations was submitted by OMNR to the Company. After review and discussion, a final list was prepared by the OMNR and presented to the Company. The Company identified how each alteration was addressed.

The reviewers were all plan advisors as identified in the Terms of Reference and in the plan itself. A number of planning team members and plan advisors took part in plan review. For the most part this was beneficial, though there were instances of conflicts regarding the required alternations, as different reviewers had different perspectives on the planning requirements. This undoubtedly created additional work prior to finalizing the plan. This was less of an issue for the 2006 plan review than the 2001 plan review.

Both plans were appropriately sealed, certified, and approved. Lists of exceptions were presented in both the 2001 and 2006 FMPs. These lists were consistent with the plans themselves and were all rationalized. The FMP contributor pages listed planning team members, plan advisors, and LCC members, as required.

3.3.9 Plan Amendments

The 2001 plan had 61 amendments to it (one major, five minor, 55 administrative). Most of the amendments were related to new forest values or water crossings. This audit has suggested elsewhere that improvements be made to the collection and management of both values and stream classification information.

The major amendment related to a caribou deferral area. Three of the minor amendments related to harvest area substitution, one to fire salvage areas, and one to adding new areas for renewal treatment. All process and administrative elements were satisfied. The volume of amendments was high. The subject of the amendments confirmed that values collection remains a weakness on this forest.

The 2004 FMPM does not require plan amendments or AWS revisions for previously unidentified natural resource features or values, or where actual locations are different than mapped locations, if an applicable AOC prescription is available in the FMP. AWS revisions were made to alter the implementation schedules for the 2001 FMP. Many revisions correspond to plan amendments. Changes were duly recorded and plans were updated where necessary.

3.3.10 Contingency Plans

There were no contingency plans required.

3.3.11 Annual Work Schedules

AWSs were reviewed for each year of the audit period. The AWSs met public consultation requirements. Each AWS was submitted and approved for implementation in April, although three of the AWSs were not approved on time. This did not result in significant operational delays. Delays in approval were attributed to a combination of the quality of the submitted reports resulting in a lengthier review period, and workload issues on behalf of the OMNR reviewers.

The reports contained all of the elements consistent with the requirements of the 1996 FMPM and the phase-in requirements of the 2004 FMPM, and were consistent with the 2001 FMP. The forest operations prescriptions (FOPs) included with the AWSs were prepared in accordance with the 1996 FMPM and were consistent with the SGRs.

3.4 Plan Implementation

The auditors assess plan implementation by tracking direct observations from field site inspections against prescriptions in the 2001 FMP, other direction provided in documentation, such as guides or policies, and performance standards generally found in

other forest management operations. The site visits are all targeted at an assigned activity within a block (e.g., renewal), but while on site, auditors also record observations with respect to other activities. For example, if a five-year old site was selected to evaluate a prescribed tending operation, the auditors will examine technical aspects of tending, renewal, site preparation, harvest, AOC, and access on the same site.

3.4.1 Areas of Concern

Values were checked in the field to verify proper implementation of the AOC prescriptions. The audit team primarily examined values from the ground, but some were examined by helicopter. A total of 38 values were documented: 12 water quality / fish habitat; 10 moose upland habitat reserves; six moose aquatic feeding areas; and 10 water crossings, two of which had been removed.

Water crossings can be a significant risk if not well installed and maintained. The Company and the District have come to an agreement that advance site visits by biologists or technicians will be undertaken if possible. Both parties acknowledged this was a challenging but beneficial practice.

Two exceptions to normal AOC management procedures were proposed in the 2001 FMP. Proposed harvest within riparian zones is permitted, but it was proposed as a more intensive operation than is normally allowed. Monitoring included documentation of the area and volume harvested as well as a joint OMNR/Bowater program to monitor the effects along shorelines. More aggressive work around eagle and osprey nests was also proposed as an exception, along with a joint OMNR/Bowater monitoring program.

The changes proposed for a new fish habitat guide are being tested in the 2006 FMP with the assistance of the Centre for Northern Forest Ecosystem Research.

Other prescriptions followed the approved manuals. There was some concern expressed about the new osprey guide. Locally, osprey may not have acclimated to human disturbance and the new smaller buffer may not be adequate.

Implementation of the marten core requirements has not been achieved. Currently, there are no cores that meet the "suitable" requirement in a landbase with 471,000 ha of capable habitat. The planning team mitigated this by including 8% of the landbase described as sub-optimal. The requirements of the marten guidelines could not be met on the BSF for two primary reasons. Recent spruce budworm infestation and past harvesting practices, including application of the moose guidelines, have increased fragmentation. Fires have exacerbated this situation, although they are not mentioned specifically. Several objectives in the 2001 FMP were directed at redressing this problem over time:

- "…more historic levels of conifer versus hardwood."
- "…towards forest age-class distributions that are more consistent with modelled natural conditions."

- "...increase the amount of suitable marten habitat on the BSF..."

In particular, the marten objective provides measurable performance requirements. The strategy requires the following (abbreviated):

- Use spatial modelling tools;
- Maintain landscape connections;
- Plan cuts greater than 260 ha to create future cores and move to NDPEG template and 80/20 target;
- Renew conifer within the constraints of the landscape;
- Increase the conifer component in select uneven-aged mixed conifer stands that are fill-planted following the first cut;
- No harvesting permitted within designated marten cores; and
- Maintain snag trees.

Past performance has fallen far short of the target for marten core areas. The planning team has addressed the problem with long-term strategies using the means available. The audit team is concerned that the first pivotal strategy will not be implemented effectively. This entails putting in place a spatial modelling system that works efficiently. In the development of the 2006 plan, differences between OMNR and Company approaches to spatial modelling caused problems. These need to be addressed and the audit team has made this a recommendation. Other aspects of the marten strategy appear to be in place and a thoughtful analysis is provided in the 2006 plan, showing the anticipated improvement in the situation. The audit team also credits the biologists with a good effort to examine the core areas in the field and optimize their layout. This recommendation will facilitate some of the concerns with ungulate habitat suitability modelling as well.

Recommendation 10: District OMNR and the Company shall improve spatial modelling systems to ensure forest plans can make progress towards the marten core targets.

The number of biologists involved in planning the BSF is unusually large due to its unorthodox four-parcel layout across two districts. There were oversights in AOC review due to coordination problems. These were addressed prior to final plan approval. Arguably, more heads are better, but the audit team suggests that some rationalization be considered.

Suggestion 3: District OMNR could consider reducing the number of biologists with direct input to plan preparation, while retaining their advisory role.

3.4.2 Harvest

The audit team inspected 46 harvesting operations on a variety of sites and conditions. Approximately 65% of the timber harvest on the BSF was implemented under the supervision of Bowater, while the balance was harvested primarily by two overlapping

licensees (i.e., Buchanan Forest Products Ltd., Thunder Bay, Ontario; Niigaani Enterprises Inc., Gull Bay, Ontario). One small operation was managed by Whitesand First Nation. To harvest its allocations, Bowater employs contractors, which are commuter-based operations. According to four of the five Annual Reports that are available for the 2001-2006 period, 21,684 ha were harvested on all of the parcels that comprise the BSF. Assuming a similar harvest rate for the fifth year of operations, the audit reviewed about 28% of the harvest area of the 2001-2006 operations. Nearly 48% of this total (10,347 ha) was harvested for salvage purposes to recover timber from areas that had been damaged by wildfires.

Observations at all harvest locations visited by the audit team confirmed that utilization and harvesting practices were generally good to excellent. While there were some instances of non-compliance found during our site visits, they appeared to be minor and isolated cases. A few high stumps were observed in areas harvested during the winter season. Rutting (i.e., site damage caused by machinery operating on soft ground conditions) was observed in at least four of the inspected blocks. These were small and isolated areas and no extensive damage was observed.

No obvious pattern of non-compliance was apparent over the course of our visits of the harvest operations. There was strong evidence in the field that harvest blocks are flagged in advance of the operations. The Company and overlapping operations are utilizing global positioning system (GPS) technology to establish the harvesting boundaries, which has increased the accuracy of the layout.

The compliance inspection program appears to be effective. Harvest blocks are normally inspected on the ground by certified inspectors and periodically by helicopter. Progress of the harvest is noted in the compliance reports by the compliance inspector. The audit team's site inspections verified that non-compliances detected by the compliance inspectors were reported and dealt with appropriately. There are delays in compliance reporting, which is addressed in Section 3.6.1 of this report. Harvest operations were consistent with FOPs and were appropriate for the specific site conditions that were encountered.

All operators progressively improved their efforts to protect streams previously unidentified in the forest inventory. When such instances were encountered, operations were stopped and an appropriate prescription was developed to accommodate the newly discovered value before operations resumed (e.g., appropriate reserves were established along the previously unmarked stream, so that heavy equipment would avoid crossing them). Performance in terms of snag retention within the harvest areas generally conformed to the applicable guidelines.

Harvest sites were virtually spotless with very little industrial garbage being found.

Bowater conducts a program to reduce piles of logging debris and chipper piles left at roadside following the completion of harvest operations. Slash piles are normally "fluffed-up" to ensure more complete consumption of the debris when burned. As a

standard operating practice, chipper piles are normally spread back into the cutover, and these are intended to be planted (Figure 3). During the field inspections, the auditors observed inconsistent application of the debris management program. Several situations were encountered where slash piles had been prepared for burning, but were not burned, and where chipper debris had not been spread out. In the case of the slash debris, Company staff explained that weather-related problems and delays in submitting the required burning plans and having them approved by OMNR has reduced the effectiveness of the program. It is noted that delays begin with slow compliance report completion and continue through fire plan approvals. The auditors are concerned with the delays caused by administrative impediments, and have made a recommendation.

Figure 3. Debris from chipper operations was spread across this landing, which was then planted.

Recommendation 11: Bowater and District OMNR shall work cooperatively to ensure that slash burning plans are submitted and approved in a timely fashion.

Recommendation 12: Bowater shall take the necessary steps to ensure that its standard operating practice for mitigating the impacts of chipper pile residue at roadside is more completely implemented.

A sampling of evidence shows that harvest areas observed in the field were properly recorded in the required tables and maps that accompany the Annual Reports. Comparisons of the Annual Report depletion maps and detailed harvest tables suggest that the depletion information is accurately recorded. Inspection of the documentation revealed that harvest operations were properly approved in the FMP (or FMP amendment) and applicable AWS. Cutting approvals, authorities to haul, and compliance monitoring reports are properly processed.

3.4.3 Renewal

During the five-year audit term (2001-2006), 25,587 ha were regenerated, which represents 91% of the planned renewal program of 28,206 ha. The shortfall in target achievement is attributed to the low achievement in natural renewal, where only 67% of the planned target has been reached. The actual planting program (15,083 ha) exceeded the planned level of 11,208 ha, due to a Company initiative to promptly plant areas that were burned in 1998 and 1999 and later salvage harvested. The auditors note that it is evident that the Company's renewal program is outpacing harvest levels over the first four years of the five-year audit term, for which complete information is available (21,684 ha harvested versus 25,587 ha renewed).

The largest proportion of the renewal program relies on artificial treatments, consisting primarily of planting and some seeding. Mechanical site preparation usually precedes the artificial renewal treatments. Patches of harvest sites where natural regeneration is evident are deferred from mechanical site preparation. Some fill-in planting may occur in these instances. Further planting efficiencies are realized through the Company's practice of planting a minimum distance from naturally established jack pine, spruce, or balsam fir seedlings that are encountered during the planting operations. Lowland sites are typically left for natural regeneration, where careful logging around advanced growth (or "CLAAG") is practiced or group seed trees are left during the harvesting phase. Chemical site preparation was used on highly productive sites. Container stock, primarily black spruce, white spruce, and jack pine, with lesser amounts of white and red pine, is used exclusively in the planting program. The planting of red and white pine coincides with one of the FMP's objectives to retain and/or increase these uncommon species on the landscape. Aerial seeding of jack pine is practiced on suitable sites where competition is expected to be light or conditions, such as shallow soils, exist that would hinder planting.

Natural renewal was projected to occur on 12,704 ha, which comprises approximately 45% of the total planned renewal operations. Natural renewal is frequently prescribed on sites where hardwood species such as poplar and white birch predominate, on lowland sites that preclude the use of mechanical equipment, or where conditions exist that would favour natural regeneration, such as spruce on lowland sites. As noted above, 67% of the natural renewal target was reached. Declines in harvesting white birch stands and lowland spruce stands during the audit term contributed to this shortfall.

In the field, the audit team observed numerous examples of silviculture treatment packages at various stages of implementation. Normally, renewal occurs within one or two years post-harvest. From one to seven years following both artificial and natural renewal treatment, treatment areas are inspected to assess their status and determine if further follow-up treatment is required. The results of the assessments are marked on paper maps, which are then transferred to the Company's GIS system. This data forms the basis for decision-making or recommendations in subsequent AWSs, where areas may be earmarked for additional treatment (e.g., tending, fill-in planting) or FTG assessment. Planting stock performance is monitored through a system of sample plots (i.e., clusters of circular plots) that the Company establishes annually.

Renewal areas are assessed again for progress and to determine if they have attained a free-growing condition meeting the standards that are assigned by the FOP. Timing of this reassessment depends on the desired forest unit, but primarily occurs seven to 10 years following the renewal treatment.

Conformity to the SGRs was apparent, and the treatments being applied appear to be effective on the renewal sites that were visited. The prescribed practices for each site and the desired future forest unit were suitable, consistent with the FOPs, and should maintain forest productivity. Bowater's pre-harvest FOP procedure has generally been working effectively and facilitates planning the renewal and maintenance program annually. Areas slated for treatment were approved in the FMP and appropriate AWS, or in the amendments. Treatment areas are generally being accurately mapped, tracked, and reported in the required Annual Reports. One exception was found where natural and artificial treatment areas had been mapped as overlapping. This error was brought to the Company's attention during the audit. The Company makes effective use of their GIS system to manage their landbase.

Compliance inspections of the renewal program indicate there is excellent conformance to the AWS and other applicable legislation. There were only two minor non-compliance incidents in the renewal program reported over the audit period, and the audit team did not observe any renewal non-compliance issues in the field.

3.4.4 Tending and Protection

Tending activities occurred on 15,154 ha over the 2001-2006 audit term, which included 9,911 ha of aerial herbicide application, 2,554 ha of ground herbicide application, and 2,689 ha of juvenile spacing. The Company's aerial tending program has underachieved the five-year planned target of 17,601 ha, due to the unexpected need to retreat several stands. Juvenile spacing achievement has exceeded the target of 2,150 ha by 25%. Juvenile spacing work on plantations was carried out under funding provided by Forestry Futures. A slight shortfall has been realized with ground herbicide application being at 91% of the planned 2,818 ha.

The audit team observed 30 sites where silvicultural treatments had been carried out. In general, the audit team witnessed an effective tending renewal program, where efforts are made to apply tending treatments promptly, discriminately, and with appropriate prescriptions. There were a few instances where there were plantations exhibiting the effects of suppressed growth due to competing vegetation. These sites were in need of immediate attention and treatment.

OMNR has imposed a 120 m wide buffer on the Company's aerial herbicide application program. This is appropriate around sites that have been identified by MOE as sensitive (e.g., critical fish habitat, stocked lakes and rivers) or have human habitation, but excessive when applied as a constant prescription. The requirement to have a buffer on a buffer is inconsistent with plan objectives to increase the conifer component of the Forest and causes unnecessary operational expense.

Aerial herbicide application next to aquatic habitat requires a minimum 60 m buffer. This distance has been determined by MOE and OMNR to provide sufficient protection to aquatic habitats. MOE guidelines require the buffer zone be extended to 120 m only in areas designated as sensitive areas (e.g., critical fish habitats, endangered species habitats, or patent land) or where critical fish habitat is likely to occur and survey data has not been collected. OMNR and companies have the option to extend the buffer zone, and this can and should be done to protect sensitive areas. However, a blanket application of an additional buffer makes little sense when the areas in question have already been harvested, site prepared, and planted with conifer. This is especially so in a forest that has objectives to increase the conifer component on the landbase to historic levels.

There are alternatives to applying herbicides aerially, but they are all less effective and more costly than using aircraft, and, if they are intended to release planted conifer crops, have the same environmental effect. It simply becomes a cost with no benefit. The auditors therefore recommend that the extended 120 m buffer zone only be applied in specified sensitive areas or areas not regenerated to conifer stand types. If the additional buffer is applied to other areas, specific justification should be noted with the prescription.

Recommendation 13: For aerial applications of herbicides, the Company shall apply 120 m buffers only to sensitive areas, as defined by Ministry of the Environment. Where exceptions to this are applied, specific justification should be noted with the prescription.

Conformity to the SGRs was apparent and the treatments being applied were effective in most cases. Application inconsistencies in the aerial herbicide treatments were noted in a few blocks, where the effectiveness was not satisfactory. The prescribed tending for each site and the desired future forest unit were suitable, consistent with the FOPs, and should maintain forest productivity. In cases where tending effectiveness was substandard, the Company should consider re-treatments. Areas slated for treatment were approved in the

appropriate AWS, or in the amendments. Treatment areas are being accurately mapped, tracked, and reported in the required Annual Reports.

Suggestion 4: Bowater should assess the aerial tending treatment blocks where treatment effectiveness has been unsatisfactory to determine the cause for the results and take appropriate action to correct this matter. Treatment blocks exhibiting ineffective results should be considered for immediate re-treatment.

Compliance inspections of the maintenance program indicate there is general conformance to the AWS and other applicable legislation. Two non-compliances related to maintenance activities were reported over the period. For the one incident for which there is information, it involved a miscalculation on the concentration of active ingredient used in a tending application. This non-compliance was deemed to be of "minor" significance. The auditors concur with the conclusions of the report and the follow-up actions taken by OMNR in this incident.

No protection treatments against insects or diseases were carried out during the audit period.

3.4.5 Renewal Support

In support of the renewal program, Bowater has annually conducted or coordinated such activities as cone collection, planting stock production, and tree improvement. The examined documentation suggests that seed inventories and the stock production programs have been adequate to support the current and projected renewal program on the BSF.

As of the end of the 2004-2005 season, Bowater had collected over 845 hectolitres of cones, comprised primarily of jack pine (748 hl) and black spruce (23 hl), with lesser amounts of white spruce, white pine, and red pine. According to the 2001 FMP, the Company's achievements appear to be lagging behind its planned target of 1,720 hl of cones. Over the same four-year period, over 16 million jack pine seeds were dispersed in the aerial seeding program. Bowater has contracted production of over 17 million container planting stock during the first four years of the audit term, compared to its five-year target of nearly 15 million trees. As noted earlier, the Company has stepped up its planting program in an effort to promptly renew the salvage harvest blocks.

All seed used in the production of Bowater's black spruce and jack pine stock production program is derived from improved seed that is collected at a first generation seed orchard. Jack pine seed used in the Company's aerial seeding program is acquired from general collection sources.

Bowater is one of 11 members of the Superior-Woods Tree Improvement Association (SWTIA), a cooperative organization with a mission to carry out tree improvement activities for its member companies in northwestern Ontario. SWTIA's purpose is to

coordinate industry efforts to establish and maintain seed orchards that deliver improved seed for reforestation, and to work with industry partners to carry out first and second generation tree breeding programs for jack pine and black spruce.
Seven tree improvement sites are physically located on the BSF, comprised of black spruce family tests (first and second generation), a jack pine family test (second generation), a jack pine cross-pollination test, two jack pine realized gain trials, and a trembling aspen provenance trial.

Bowater and Abitibi Consolidated Company of Canada (Abitibi) cooperate in the management of the black spruce and jack pine tree improvement program in the Lake Nipigon West breeding zone. Abitibi primarily manages the black spruce program and splits the program costs with Bowater on a 50/50 basis, while Bowater manages and pays for the entire jack pine program. Both companies are cooperating in the initial stages of establishing a second-generation black spruce seed orchard, while Bowater is in the process of establishing a second-generation jack pine seed orchard. Management of the orchards includes such activities as tending and maintenance, conducting performance surveys, collecting scions, selecting plus trees, establishing family test sites, conducting controlled breeding, rouging, and collecting cones.

Bowater is an active member of the Forest Renewal Co-op, whose members share the goal of ensuring quality forest seedlings and proper plantation establishment for the regeneration of tomorrow's forests. The Co-op engages in research projects that foster a greater understanding of the factors and processes involved in seedling development and stand establishment.

The Company's renewal support program is excellent.

3.4.6 Access

Parts of the four parcels of land that form the present-day BSF have been harvested for timber products as far back as the 1890s. Information on logging history suggests that the earliest road access to the BSF was established in the 1940s, with the construction of the Black Sturgeon Road to the Main Parcel. Road access to other parcels of the BSF did not become a reality until the 1960s when the first all-weather roads were starting to be built northward from Thunder Bay. The main highway artery that accesses the BSF (Highways 527) was built under cooperative programs between the forest industry and the government at that time. As road development has been an ongoing activity for over 60 years, the BSF benefits from a fairly well-developed access infrastructure. The road construction program for the five-year audit period reflects the high level of existing access, with a planned construction level of only 15 km of secondary roads for the five-year period. No primary road development over the audit term had been planned. It was noted that no new primary or secondary road construction is planned for the 2006-2016 operating term.

Although there are some challenging road building situations found on the Forest due to topography (e.g., the cuestas and mesas found in the Current River and Main Parcels), the BSF appears to have adequate access to aggregate resources at most locations compared to other forests in Ontario. Glacial outwash plains, eskers, and morainal features are found more commonly in the Main Parcel, and less prominently in the remaining parcels that constitute the Forest. Except for a few wet areas, most roads are usable for hauling timber during the entire year with conventional haul trucks.

There are numerous streams and rivers found throughout the Forest, which require crossing in order to access the timber resource. For all water crossings, Bowater and the overlapping licensees perform the required hydrology calculations to determine appropriate culvert or bridge opening size and submit, as part of the AWS, detailed bridge or culvert designs to OMNR for approval. All crossing structures follow design guidelines approved by OMNR. OMNR District staff inspect all crossing locations prior to issuing final approval for the crossing structure.

Bowater may utilize temporary (portable) bridge structures for crossing streams when culverts are inappropriate. A set of template portable bridge designs pre-approved by OMNR will be included with the AWS, if any are proposed for installation.

Should an unmapped stream be encountered during road construction, work is immediately stopped and the new value is flagged. An AWS revision and new water crossing plan is submitted to OMNR for approval. Water crossing prescriptions and procedures to be followed when an unknown stream value is encountered are thoroughly detailed as part of the AOC documentation in the 2001 FMP.

When installing or removing a water crossing (Figure 4), Bowater and the overlapping licensees are required to adhere to the AOC prescriptions listed in the 2001 FMP. These prescriptions apply to all road classifications and include a list of reference documentation and the standard operating procedures to be followed. Prior to each removal, a joint meeting is held between Bowater, the related overlapping licensee and, on occasion, OMNR District staff, to determine the process for removal, including the measures for long- and short-term erosion protections and any other rehabilitative work. Removal work is undertaken in accordance with the *Criteria for Removal of Water Crossings of Abandoned Roads* (OMNR 1997).

The audit team travelled extensively on BSF roads during the field audit and was satisfied that construction practices were generally good. By and large, roads are well maintained, and only a few minor problems were noted. One exception to this favourable assessment was along the road into FMP Block 3033, where excessive bulldozing had taken place during construction and no rehabilitation effort had been undertaken.

Bridges that were installed during the period were particularly well constructed, with riverbanks appearing virtually undisturbed. Appropriate measures such as diversion ditches, sediment traps, and riprap were used to control erosion around the structures. Bridge decks were generally very clean. Culverts were properly installed with

appropriate pipe lengths and widths and suitable sloping around the structures. Materials used around the openings were non-erodable or sufficiently vegetated and stabilized to control erosion. Issues were found around older culvert crossings, where erosion was evident to the point that culverts were nearly plugged with sediment. More attention is needed to address these failing crossings.

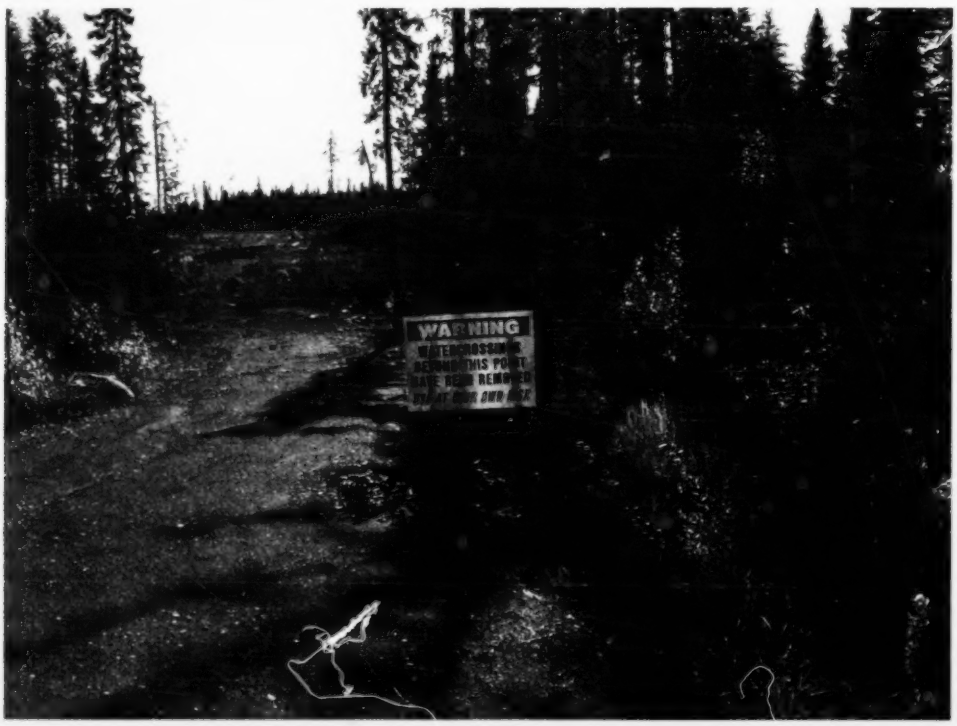

Figure 4. This water crossing removal was well marked and stable.

Recommendation 14: Bowater shall conduct an inventory of older crossings to determine if remedial action is required to address situations where crossings are becoming harmful to the environment (e.g., harmful alteration, disruption, or destruction of fish habitat). Where harm is occurring, the Company shall follow the procedures for unplanned water crossing replacement or water crossing removal, as the case may be, as described in the 2006 forest management plan.

There were 17 non-compliances reported over the audit period dealing with access, with most (12) being reported during the first year of the audit term. Issues with water crossings (e.g., failure to follow AWS crossing details, long-term erosion protection not in place, and other unacceptable construction practices) were the primary reasons for the non-compliances. In nearly all cases, voluntary self-compliance was exercised to correct the situation. It was noted that Bowater had identified water crossing installations and removals as an area of priority in its most recent Annual Compliance Schedules of Action (ACSAs). The increased vigilance in this regard appears to have paid off. Performance in

relation to water crossings has improved over the audit term, with no non-compliances related to access being reported over the past year.

Selected road locations were compared to those in the FMP. In all cases, roads were located within approved corridors and locations as prescribed, or an appropriate FMP amendment was submitted to authorize the modified location.

The audit team was required to select a sample of roads maintained under the 2005 "Road Maintenance Agreement" and determine if there was evidence that the work was performed as described in the invoices. The auditors did travel most of the roads on the BSF and confirmed that invoices submitted within the agreement were for work performed on the BSF. The team was unable to physically verify whether or not the specified maintenance activities (e.g., snowploughing, grading and sanding) occurred in 2005.

3.5 Systems Support

3.5.1 Human Resources

All subcontractors are provided EMS training annually. It was normally closely related to their current responsibilities. There is a strict start-up procedure to ensure that workers are aware of sensitive issues and adequately trained to meet the needs.

Training materials provided by OMNR and the Company were examined. An example provided was the *NDPE Guide to Wildlife Tree Selection* for the Thunder Bay Woodlands operations, which is a plasticized key containing relevant information for machinery operators. It was well prepared. This helps to ensure training information is within reach after the training has happened. Supervisory staff are accessible and contact information is provided in the booklet. This attention to detail is evidence of an effective environmental management program.

OMNR training records were examined and found to be in order. OMNR does not have a formal training matrix, and it is difficult to evaluate the efficacy of the corporate training effort. All staff interviewed had received recent training.

During the field reconnaissance of the Main Parcel, discussions occurred between OMNR, Bowater, and Buchanan regarding fire line installation and rehabilitation. It was noted that during the recent 2006 fire flap, there was need for some emergency fireguard line creation and emergency pumping. The audit team noted that discussions centered on the width of fire lines, berm piles, sump holes interfering with groundwater, and crossing of creeks with heavy equipment. In addition, the Company expressed concerns regarding poor communications during the fire flap and the initial stages of the rehabilitation efforts.

It was noted that the Nipigon 052-05 fire line paralleled a brook trout creek for approximately 3 km. Berm piles were pushed into the stream and the stream was crossed in a couple of locations with heavy equipment. Rehabilitation efforts included pulling all of the material out of the creek, re-contouring the stream channel, and repairing water crossings. The fireguard line exposed mineral soils, which, to date, have not been rehabilitated, albeit a native seed mix and sources are being investigated.

All parties recognize the time requirements/constraints surrounding emergency fire situations and the audit team recognizes that OMNR is slowly changing its environmental practices, and, to date, the rehabilitation efforts on this fire are commendable. However, it is evident that additional training may help to reduce the environmental impacts of fire management efforts.

Suggestion 5: To help reduce impact to the environment and rehabilitation effort costs, the Company and Regional OMNR should further review the execution of fire line procedures and training requirements, and recognize the need for rehabilitation of fire lines.

3.5.2 Documentation and Quality Control

Bowater has good backup procedures for storage of current information. The auditors examined the record keeping system that has been put in place as part of the Bowater ISO EMS. The extensive hardcopy filing system in the Company office was sampled for paper records of our field samples. No problems were found. Current guides, policy, and other documents were available as required.

OMNR documentation was generally in good order. There was some difficulty in accessing compliance records from the first year of the audit period. This information was provided by OMNR once the gap had been identified.

3.6 Monitoring

3.6.1 General Monitoring

The Thunder Bay District initially prepared a District Compliance Strategy that covered the five-year period, 1999-2004. Since that time, the Strategy has been revised on two occasions: in 2001 and again in 2003. The strategy provides guidance for implementing the compliance monitoring program on all aspects of natural resource management, protection, and maintenance that falls under the jurisdiction of OMNR within the Thunder Bay District. The Strategy broadly describes the District's natural resources base that is to be monitored, including significant features related to compliance. There is a section devoted to "compliance issues," categorized by the various programs

administered by OMNR (e.g., fisheries, wildlife, forests, lands, fire, and planning compliance).

Nipigon District prepared the required Annual Compliance Operating Plans (ACOPs) during the audit period. Planned compliance activities for monitoring the Forest's program included joint field inspections, unplanned compliance inspections and verification audits on SFL holder operations, random inspections of the AOCs identified in the FMP, water crossing inspections, and annual compliance meetings with forest industry staff. Quantitative targets were assigned to most of the measures listed in the ACOP and were allocated by area team. The ACOP text states that outcomes will be reviewed and attached to the plan at the end of the year. No review was found attached to the plans that were examined.

Evidence gathered through the audit team's inspection of field sites and compliance reports indicates that the level of monitoring is suitable considering the degree of non-compliance that is reported on the BSF. OMNR District staff conduct verification inspections of Bowater (and overlapping licensees) compliance inspections, inspections of water crossing construction activities, and spot checks for adherence to forest fire prevention regulations. District compliance staff report that Bowater conducts an effective compliance monitoring program. Compliance report submission is not as timely as stated in the Company's compliance plans. Bowater received its ISO 14001 EMS certification in 2002, which coincided with noticeable improvement in compliance performance.

There are currently four staff in the OMNR Nipigon District and one in the Thunder Bay District office that are certified compliance inspectors and conduct inspections on a regular basis on the BSF. Although the number of staff trained to perform compliance inspections is adequate, the number of inspections being conducted by OMNR appears to be only minimally acceptable. There is not sufficient concern to support a recommendation at this time. It is an issue that should be tracked through the next audit period.

Suggestion 6: District OMNR should ensure that the number of compliance inspections does not decline below current levels.

Bowater prepared a five-year Compliance Plan covering the 2001-2006 period which was approved by the OMNR Nipigon District Manager on February 7, 2001. The five-year plan met all of the requirements outlined under the OMNR's *Guideline for Forest Industry Compliance Planning* (OMNR 1998). A background description of the BSF as it relates to the compliance monitoring program, as well as comprehensive sections dealing with goals, objectives, and strategies, were included. Monitoring and reporting procedures are outlined, measures for dealing with non-compliances are described, and roles and responsibilities for implementing the compliance program are defined. The plan is complete and well written.

Bowater has also prepared ACSAs for each of the five years within the scope of the audit (2001-2006). The ACSAs are included as appendices in the respective AWSs. The ACSAs list the priority areas for compliance effort (e.g., road construction, AOCs, water crossings, harvest block boundaries, snag retention, and wood utilization), normally based on compliance issues that have occurred during the previous year or expected high-risk areas for the upcoming operating season (e.g., introduction of new NDPEG). A protocol for monitoring, inspecting, and reporting is described, including remedial action procedures to be followed when non-compliances are found. The plan states that monthly and quarterly compliance activity reports will be prepared and submitted to OMNR. The reports are to include a schedule of upcoming activities for the period covered by the report and serve as notification to OMNR.

Overlapping licensees are expected to implement the ACSAs on their own respective operations. Normally, SFL holders are ultimately responsible for all compliance activities on the license area, including those of the overlapping licensees, according to OMNR Policy ENF 22.02.01. However, provisions can be made where an overlapping licensee can be responsible for compliance monitoring on its own respective operations. In so doing, the overlapping licensee becomes a "Qualified Overlapping Licensee" (QOL). There is a protocol for enabling these arrangements, which is described in the OMNR's revised *Guideline of Forest Industry Compliance Planning* (OMNR 2005). Under the arrangements, the SFL holder is partially relieved of responsibility for compliance matters on the QOL's operations, provided that the QOL works within the framework of the compliance responsibility model. SFL holders are required to conduct annual performance assessments of the QOL's operations. The terms of the compliance monitoring arrangements can be altered should the QOL fail to perform to the required standards. In the case of the BSF, Buchanan Forest Products is considered to be a QOL. Bowater's 2001-2006 Compliance Plan has been amended to reflect the QOL compliance monitoring arrangements. As well, the Company's 2005-2006 ACSA also explains the new arrangements.

Compliance monitoring plans were approved on time. A sampling of cutting approvals demonstrated that issuance dates did not precede the date of approval of the compliance monitoring plans.

Reporting by Bowater and the overlapping licensees is completed in a satisfactory fashion and procedures outlined in the compliance plans are generally being followed, but are not always completed in a timely manner. OMNR personnel advised the auditors that some of the monthly activity reports did not contain accurate information.

Recommendation 15: Bowater shall ensure that it adheres to commitments and timelines made in its Annual Compliance Schedules of Action, and shall take steps to improve the accuracy of the information included in its compliance activity reports.

A total of 873 compliance inspections were completed during the audit period: 806 by Bowater and the overlapping licensees and 95 by OMNR. Twenty-eight Forest

Operations Compliance Information System (FOCIS) reports completed by OMNR in 2001-2002 were not viewed directly by the audit team, as they were tracked in a separate computer system. Table 2 provides further details regarding the instances of non-compliance that were reported for the years 2002- 2006. A total of 39 incidents of non-compliance occurred over the audit period, according to Company statistics, out of the 806 Company-filed reports. OMNR's statistics show that 19 incidents of non-compliance occurred over the same period. The disparity between the two sets of numbers is attributed to reporting limitations under the older compliance reporting system, which did not always produce accurate results. Of the 19 non-compliance incidents investigated by OMNR, 15 were categorized as "minor" and four were "moderate." None of the reported non-compliances were considered to be "significant."

Table 2. Summary of compliance inspections on the Black Sturgeon Forest.

SFL & Overlapping Licensees Compliance Inspections 2001-2006				OMNR Compliance Inspections 2002-2006*			
Activity Inspected	Total Number of Reports	In compliance	Non-compliance	Activity Inspected	Total Number of Reports	In compliance	Non-compliance
Access	100	85	18	Access	21	13	8
Harvest	402	384	18	Harvest	40	31	9
Renewal	228	224	4	Renewal	3	1	2
Maintenance	76	74	2	Maintenance	3	3	0
Protection	0	0		Protection	0	0	0
TOTALS	806	767	39	TOTALS	67	48	19

* Data unavailable for 2001-2002

Activities and causes for the non-compliances were varied, although the access-related non-compliances generally involved problems at water crossings. Harvesting infractions were associated with activity within unmapped intermittent streams, cutting into AOCs, and failing to comply with snag retention guidelines. Four penalties were assessed against an overlapping licensee for non-compliances that occurred on operations under its control. Two repair orders were also issued. All non-compliances were brought to the attention of the LCC. There has been a downward trend in the frequency rate of non-compliance reports over the term. The overall non-compliance frequency rate for the audit period, based on Bowater's figures, was 5%. This accomplishment is commendable

and reflects Bowater's determination to reach their compliance plan objective of continuously improving their performance.

There are five forest sustainability criteria that license holders are required to monitor in order to assess their progress toward achieving forest sustainability. The five criteria are:

- Biodiversity;
- Forest condition and ecosystem productivity;
- Multiple benefits to society;
- Soil and water conservation; and
- Accepting society's responsibility for sustainable development.

There are a number of measurable indicators associated with each of the above criteria that the licensee can monitor. However, according to the phase-in requirements in the 1996 FMPM, license holders were required use the best information available, and formal assembly of the data for reporting these indicators does not need to be completed until after 2007. The phase-in schedule only requires Table RPFO-14 (*Summary Report of Managed Crown Forest Available for Timber Production*) and Table FMP-19 (*Summary Report of Frequency Distribution of Clearcut and Wildfire Sizes*) be completed. Tables RPFO-14 and RPFO-19 were not prepared for the 1996-2001 Report of Past Forest Operations (RPFO) as required.

Recommendation 16: The Company shall complete Tables RPFO-14 and RPFO-19 for the 1996-2001 Report of Past Forest Operations.

The auditors are confident that the Company possesses the capability to compile the data necessary to measure its progress for the sustainability indicators. Much of this data can be derived from the Annual Reports, compliance monitoring programs, silvicultural effectiveness monitoring, and other reporting systems that the Company has in place. Bowater is regularly collecting and recording the tabular and spatial data needed to meet the 1996 FMPM requirements. Judging from the evidence observed by the audit team, Bowater will be in a good position to carry out the appropriate sustainability analysis when it is required.

Bowater did not have a formal documented methodology for assessing silviculture effectiveness in the 2001 FMP. In the 2006 FMP, the Company has presented a logical and comprehensive description of its silviculture effectiveness monitoring program, which lists the progression of stand monitoring activities from pre-harvest surveys to free-growing declaration and inventory updating with new stand attribute information.

Overall assessment of silviculture effectiveness is conducted on a forest-wide basis through regular reporting as required by the 1996 FMPM and FIM. Data is compiled and evaluated annually through the annual reporting process and also summarized over a five-year period when the RPFO is prepared (or Year 7 and 10 in future Annual Reports under the 2004 FMPM). The Company is required to provide commentary and an evaluation of program achievements and effectiveness when the reports are submitted.

Over the 2001-2006 audit term, 83,936 ha of renewal areas were surveyed for regeneration success, which represents 458% of the planned level of 18,326 ha. Of the area surveyed, 31,608 ha did not meet the success standard, translating to a success rate of 62% for the areas surveyed, or 52,327 ha successfully renewed. According to the Company, a large proportion of the area surveyed is comprised of stands that were naturally renewing after being depleted by wildfire in 1996. Judging from the results, a significant proportion of these previously disturbed areas require additional time to meet the regeneration height and/or stocking standards. The Company has noted that these areas had been difficult to access when they had burned and, therefore, were not artificially renewed. Areas not meeting the free-growing standards are scheduled to be re-assessed in future years.

The audit team's field visits, coupled with our examination of documentation, confirmed that the boundaries of the sampled field locations had been properly mapped and accurately recorded in the Company's reporting system. Observations in the field generally supported the Company's claims of free-growing status and generally agreed with the new stand descriptors in most cases. There were a few instances, however, where the recorded stand description provided to the audit team did not match the stand composition observed in the field. It became apparent on these occasions that there was a tendency for the assessor to "lump" stands together, rather than stratify the stands where there were obvious differences in stand characteristics. Issues with the declared stocking density were also noted, where the observed stocking was lower than the reported stocking. These reporting and assessment issues are confirmed in a brief report produced by OMNR Thunder Bay District that examined 20 blocks that had been declared as free-growing in 2003. The OMNR report notes that there was agreement with the FTG height and stocking descriptors in 60% of the cases and agreement on the declared forest unit 20% of the time. The results of this report are disconcerting and require the Company to review its free-growing assessment procedures.

Recommendation 17: Bowater shall re-evaluate the methodology it currently employs for stratifying stands when conducting free-growing assessments.

Nearly all FTG assessments are conducted using ocular means by helicopter. Stand descriptions that are observed during the flight are written on assessment forms that are tied to locations on maps that accompany the observer. These maps are turned over to the GIS department, where both spatial and tabular attributes are transferred to the forestry database. For areas that are not deemed FTG, reasons are noted (e.g., needs more time to grow or brush competition needs to be controlled) and the area is scheduled to be re-examined in future years. OMNR staff have occasionally accompanied Company staff during the FTG flights.

Suggestion 7: In preparation for free-growing assessment work using visual methods, Bowater should consider establishing pre-sampled plots that would assist observers in calibrating their ocular assessments.

The auditors are satisfied that the actual level of the overall monitoring program was in general accordance with the 2001 FMP and is being conducted appropriately. A few refinements to the methodology are required to help increase the accuracy of the reported results.

The 2001 FMP proposed that monitoring take place to assess the effectiveness of treatments that were exceptions to the implementation guides. The treatments to be monitored involved:

- harvesting on northwestern Ontario Ecosite 12, which is considered as a silvicultural treatment that is an exception to the silvicultural guides;
- harvesting within the vicinity of four osprey nests outside of the prescriptions permitted under the implementation manuals; and
- harvesting within the vicinity of a heron rookery outside of the prescriptions permitted under the implementation manuals.

Monitoring plans for the Ecosite 12 silviculture exception are being coordinated through OMNR's Northwest Regional Office and are described in the publication *Full Tree Harvesting of Ecosites 11 and 12 in Northwestern Ontario: Monitoring Procedures and Best Management Practices, April 2001* (ES 11/12 Soil Monitoring Procedures Working Group 2001).

Monitoring plans for the osprey and heron rookery exceptions were described in the 2001 FMP (Section 2.5.3). No monitoring has, in fact, been taking place as no harvesting has occurred within AOCs.

3.6.2 Annual Report

For the first three years of the audit term, the Annual Report consisted of two parts, a spring submission and a fall submission, which were due April 15 and November 15 of each year, respectively, and prepared in accordance with the 1996 FMPM. Starting in 2004-2005, Annual Reports were submitted as a single package, due by November 15 of each year, and were prepared in accordance with the 2004 FMPM. Bowater has been reasonably close to meeting most submission requirement dates, with the exception of the Annual Report 2003-2004 Parts 1 and 2, which were 15 months and nine months overdue, respectively.

Starting with the 2002-2003 Annual Report (Part 1), Bowater has been submitting the Annual Reports through the FIM Portal. OMNR personnel at the Nipigon District office were unable to retrieve information from the FIM Portal, indicating that they had not received adequate training in the use of this application. Having the capability of retrieving data from the FIM Portal data is an important skill for OMNR staff, particularly for those who are responsible for reviewing the Company documents that are now submitted to OMNR in this fashion.

Recommendation 18: OMNR Nipigon District shall ensure that appropriate staff receive training in the use of the Forest Information Manual Portal.

Prior to the establishment of the FIM Portal, it was noted that OMNR's Head Office issued direction to its staff in September 2000 (revised to Version 2 in November 2002) listing a protocol for reviewing the Annual Reports, which includes deadlines (review deadlines had not been specified in the original 1996 FMPM). The protocol included a checklist, which the OMNR staff reviewer was required to complete, showing the date the Annual Report was received and the date that the review was completed. A review of these checklists at the OMNR Nipigon office revealed that the checklists for the 2001-2002 and 2002-2003 Annual Reports (Parts 1 and 2) had been completed as required. The dates and comments on the checklists indicate that there were significant issues with the data Bowater had submitted with the 2001-2002 Annual Report (Part 2), and it was not officially accepted by OMNR until February 2004. The 2001-2002 Annual Report (Part 1) and 2002-2003 Annual Report (Part 1) were not officially accepted by OMNR until July 2004. No reasons were determined for the tardy acceptance of these two reports.

There are recent developments regarding the review of Annual Reports, which was released to OMNR staff in 2004. The OMNR District must review the Annual Reports at specified milestones, but has the option of accepting the Annual Report "as is" in other reporting years.

The format of the 2000-2001 to 2003-2004 Annual Reports conformed to the requirements of the 1996 FMPM and the information reported in the tables appears to be consistent with the objectives of the 2001 FMP. Table AR-12.2 (*Annual Report of Forest Operations Inspections Conducted by MNR*) is missing from the 2001-2002 Annual Report.

The Annual Reports are generally of good quality. The level of analysis and commentary satisfactorily meets the applicable FMPM requirements, with a couple of exceptions. Some discrepancies were noted in the completion of some tables. A few tables were not completely filled out according to the requirements, or there were inconsistencies between the values presented in the tables and those referenced in the report text. Table 3 presents some examples of problems found with Annual Report tables.

Table 3. Examples of problems with Annual Report tables.

Annual Report Year	Table	Problem
2001-02	AR-7	*Current* values appear to be incorrect; report text does not reflect what is recorded in the table.
2003-04	AR-3	*Remarks on Progress* column not completed
2003-04	AR-10	*Construction* columns not completed
2004-05	AR-4	*Actual Harvest Area* column not completed
2004-05	AR-3	*Remarks on Progress* column not completed

Table AR-14 (*Annual Report of Regeneration and Silvicultural Success*) in the 2004-2005 Annual Report appears to be filled out incorrectly and does not provide fully meaningful results. It appears that the Company is encountering difficulties with the proper completion of this table due to the approach it had used in recording the planned numbers in Table FMP-28 (*Forecast of Assessment of Regeneration Success*) in the 2001 FMP. Treatment success by forest unit would have been more effectively tracked and evaluated if the treatments had been listed by the unique SGR code number, rather than the site treatment package (STP) identification number. Bowater should seek direction from OMNR on how Table AR-14 should be properly completed in future Annual Reports so that the results are more purposeful.

Recommendation 19: Bowater shall ensure that Table AR-14 is completed in accordance with the Forest Management Planning Manual.

Clearcut sizes larger than 260 ha were approved in the 2001 FMP, as permitted under the Class 1994 Timber Class Environmental Assessment. Appropriate biological rationale for these clearcuts is provided in the FMP text. Fifty-seven harvest blocks during the term were planned to be larger than the 260 ha size limit.

The silviculture guides do not address post-wildfire stand conditions and associated renewal options. Therefore, all STPs applied to the fire salvage area were considered to be "exceptions" to the guides, even though the packages were implemented in the same manner as those implemented in "normal" areas. Under these circumstances, Bowater was obliged to develop a monitoring program for these renewal activities, which is described in Section 4.5 and Appendix 10 of the 2001 FMP.

Section 2.5 (*Monitoring and Assessment*) of the 2001 FMP describes a monitoring program that is proposed to be conducted in the event that harvesting operations are conducted near eagle/osprey nests or heron rookeries. The 2004-2005 Annual Report text suggests that harvest operations were approved to take place near eagle and osprey nests, however these stands were not cut.

There was no evidence of any conclusions being reached to date with respect to the monitoring for exceptions.

Recommendation 20: The Company shall ensure that progress with regard to any exceptions monitoring program being conducted on the Black Sturgeon Forest be reported annually in the Annual Reports, as required by the 2004 Forest Management Planning Manual.

The results of the previous IFA are only mentioned briefly in the 2001-2002 and 2002-2003 Annual Reports (Part 2). The text only describes the status of the 2001 audit report, but does not summarize the results of the audit, contrary to the requirements of the 1996 FMPM.

Recommendation 21: The Company shall ensure that future Annual Reports prepared for the Black Sturgeon Forest comply with the requirements of the Forest Management Planning Manual. Specifically, the text should include a summary of recommendations from action plans prepared in response to independent forest audits conducted during the applicable plan period.

3.6.3 Report of Past Forest Operations

The 1996-2001 RPFO prepared for the BSF was reviewed for this audit.

The RPFO contains most of the tables required under the transitional provisions in the 1996 FMPM. In some cases, not all data elements were available, as past reporting requirements were less stringent. For example, Table RPFO-3 (*Summary Report of Planned Harvest Area by Licensee*) was not completed correctly, as there is no breakdown by age class for each of the forest units. Comparisons between the Annual Report tables and the RPFO tables found that the RPFO tables were accurate. Table RPFO-14 (*Summary Report of Managed Crown Forest Available for Timber Production*) and RPFO-19 (*Summary Report of Frequency Distribution of Clearcut and Wildfire Sizes*) are missing, as discussed in Section 3.6.1 of this report.

The text of the RPFO offers comparisons between planned activities and actual levels of operations that were comprehensive and provided ample detail. Discussion and evaluation for most of the tables was quite substantive. Actual achievements and trends are discussed in inclusive terms throughout the report text. Explanations for the deviations from planned levels were reasonable and usually included sufficient detail. For example, shortfalls in reaching harvesting targets are attributed to several factors such as major fire disturbances causing considerable scheduling difficulties, encountering lower than expected yield in stands, poor markets for certain species, and interruption in mill operations. Underachievement experienced in the renewal program resulted primarily from the shortfall in reaching harvest targets and deficiencies with tracking natural renewal areas. Overall, the explanations for deviations from planned targets are plausible.

As noted above, not all of the RPFO tables can be completed. The absence of this information renders it impossible to conduct some of the analysis that meets the full requirements of the 1996 FMPM. Despite these limitations, the Company attempted to undertake an assessment of sustainability by providing an analysis of the available information. The report examined trends in wood fibre forecasts, the relative abundance of landbase over time, changes in age-class structure and forest composition over time, and area harvested versus area renewed over the RPFO term. The report acknowledges that there is insufficient information to allow a definitive conclusion on sustainability to be reached, and that better sustainability indicator data should be available in the near future. The Company deserves credit for attempting to assess forest sustainability in the absence of some of the indicator data.

The section dealing with achievement of management objectives is very comprehensive. Each objective from the 1996 FMP, and the targets and strategies associated with each management objective, are listed and evaluated in a tabular format. This table is well done and provides an informative synopsis of the forest management achievements during the 1996-2001 period.

The draft version of the 1996-2001 RPFO was submitted before its deadline, while the final version was submitted slightly behind schedule. This did not affect the production of the 2006 FMP.

The 1996-2001 RPFO does not explicitly discuss how successfully the selected management alternative was implemented, since an analysis of management alternatives was not required for FMPs prepared for 1996. Additionally, Table RPFO-2 (*Summary Report of Depletion Area: Comparison to the Selected Management Alternative*) was not required to be completed for this RPFO, which is a critical component for analyzing the success of implementing the selected management alternative. The Company provided an incomplete Table RPFO-2. Analysis for this table was limited to "actual" versus "planned" numbers. The text related to this table provides adequate explanation for the harvest depletion shortfalls.

Section 5.0 of the RPFO contains a review of the assumptions that were applied in the wood supply models used for the 1996-2001 FMP. The text describes how two software applications (MADCALC and FORMAN) were employed at that time to determine harvest area and volumes. The assumptions are reviewed in the RPFO text and presented in a tabular format. The wood supply models employed in 1996 were considerably less complex compared to the SFMM used in current forest modeling exercises. The number of inputs and constraints capable of being applied to these early models was limited (e.g., natural succession rates and wildlife habitat were not considered in these models). Comments are provided in the RPFO that suggest that most of the input parameter values were reasonable, however, changes to some of the assumption parameters are warranted. For example, FTG renewal periods were thought to be conservative for some forest units and turnover rates were considered to be too low for lowland spruce.

Discussion related to the comparison of planned versus actual wood harvest volumes indicated that there were shortfalls in reaching the volume targets for all of the mills that source at least part of their supply from the BSF. The shortfalls ranged from 27% of the volume originally planned to be delivered to Bowater's mill in Thunder Bay to 87% to all other mills that receive wood from the BSF. The shortfalls were caused by disruptions from large wildfires, poor market conditions, and low yields encountered in overmature and budworm-damaged stands. Deliveries to the Bowater mill were 1.9 million m^3 over the period, which is 73% of planned. The balance of the harvested volume (approximately 166,000 m^3) was delivered to 16 other mills. There is no clear indication in the report text that there were any legal requirements to provide a mill with a specified volume of wood from the BSF during the 1996-2001 period. Since the wood directive information is not acknowledged in the RPFO text, it is difficult to clearly evaluate how well the wood supply targets for the mills supplied by the BSF were achieved.

The overall volume yields show that the planned estimates used in 1996-2001 were accurate. The total planned yield/ha was 106.8 m^3/ha, while actual results were 101.1 m^3/ha. When broken down by parcel, however, there were differences. The largest variance occurred in the Main Parcel, where actual yields were 71.8 m^3/ha versus 100.4 m^3/ha planned. The RPFO text suggests that adjustments to the yield curves should have been considered in 1996 to account for budworm damage. It is noted that Bowater appears to have undertaken an extensive exercise during the preparation of the 2006 FMP to increase the accuracy of their yield forecasts. The results demonstrate that the overall expected yield from timber harvesting is 108 m^3/ha, which is very similar to the yield predictions from the 1996-2001 FMP.

Bowater was not required to produce a Table RPFO-9 (*Summary Report of Harvest and Regeneration Success*). However, the Company did attempt to complete this table. The analysis for this table does not discuss the success of silviculture treatments, the accuracy of predictions of future forest units, or the year of successful regeneration in the context of the table, since the projected figures are not available for the actual regeneration areas recorded. Discussion related to silviculture effectiveness is only presented in broad terms. Future versions of this table should prove more helpful in providing greater insight for renewal trends.

Bowater attempted to complete Table RPFO-11 (*Summary Report of Forest Operations Inspections*), although it was not required. The report states that the Renewal Trust experienced a shortfall in revenues of approximately $3 million, and that a one-time permitted transfer of surplus funds from other Bowater SFL holdings helped balance the account. Revenues during the 1992-2001 period were $8.5 million compared to expenditures of $11.6 million. These expenditures do not include $910,000 spent through special Forestry Futures funding.

The 1996-2001 RPFO provides a list and brief description of amendments to the 1996 FMP that were submitted for consideration during the 1996-2001 period. There were 38 amendment requests submitted by Bowater during the five-year term, of which 33 were known to be approved: four minor and 29 administrative. There were no major amendments processed. Three amendment requests were not approved or not processed. The status of two amendment requests is unknown. One is missing and another has no approval date.

The number of amendment requests is reasonable, considering that many of the amendments were related to salvaging burned or budworm-damaged timber. The rationale provided for requesting the amendments and the amendment classifications all appear to be appropriate for the circumstances.

Under the Conclusions and Recommendations section of the 1996-2001 RPFO, the document includes remarks organized under nine sections:

- Harvest/Depletions
- Renewal/Support

- Access
- Revenues and Expenditures
- Assessment of Forest Sustainability
- Review of Assumptions
- Current Plan Operations (2001-2021 FMP)
- Issues Identified for the 2006-2026 FMP
- Independent Forest Audit

The first six sections of the report briefly summarize and discuss the findings and analysis presented earlier in the document.

The *Current Plan Operations* section briefly describes some of the achievement and underachievement during the first two years of the 2001-2006 operating term and notes the progress made in comparison to the 1996-2001 term. A specific strategy being adopted in the 2006 FMP to increase wood utilization, which is in response to a 2001 IFA recommendation, is discussed.

The *Independent Forest Audit* section summarizes the 2001 IFA's 31 recommendations and the action plan items arising in response to the recommendations.

There is ample evidence that the conclusions and recommendations encapsulated in the RPFO were incorporated in the 2006 FMP planning process. For example, Objective D1 addresses the need to revitalize low volume, poorly stocked stands; several references to the 2001 RPFO are made in the discussion involving yield tables; a target for formalizing a road use and maintenance strategy for the next FMP is listed; and a density management strategy has been incorporated, all of which is in response to the RPFO or the 2001 IFA recommendations. The Company has cultivated good linkages between the RPFO document and the 2006 FMP. The only criticism is that the recommendations in the RPFO tend to be buried in the text and cannot be quickly referenced by the reader.

The FMPM suggests that the RPFO text include specific conclusions and recommendations for each subject area, and suggests that these conclusions and recommendations be included in each RPFO text section. There are conclusions drawn based on the results, and there are several recommendations sprinkled throughout the report text. The only difficulty encountered was that the recommendations were not specifically listed or highlighted in the text. For the benefit of the plan author, it would have been helpful to have singled out the recommendations in the text and perhaps listed them in the RPFO conclusion section as well.

Suggestion 8: Bowater should ensure that in future reports where the purpose is to evaluate past performance (e.g., Annual Reports under the new FMPM), statements that are intended to stand as recommendations should be clearly highlighted in the report text.

3.7 Achievement of Management Objectives and Forest Sustainability

The success of forest management activities must be assessed in terms of meeting the objectives they were designed to achieve. By comparing planned activities with actual levels of achievement, it is possible to judge the success of the management plan in terms of satisfying its objectives. Forest sustainability is the overriding objective of the CFSA. By reviewing planning documents and comparing those to reports and examining trend data provided by OMNR and the Company, the auditors can attempt to make a judgment on the sustainability of the Forest.

3.7.1 Achievement of Management Objectives

The 1996 RPFO lists five objectives, each with specific targets and strategies for achieving the targets. The report also includes a well-ordered and detailed assessment of the Company's success in achieving management objectives. These are included in Table 4 of this document, along with auditor comments.

Table 4. Audit team comments regarding management objectives from the Black Sturgeon Forest Report of Past Forest Operations for the forest management planning period 1996-2001.

Objective	Achievement	Comment
Harvest: To harvest merchantable timber from the BSF through accepted principles of sound forest management within a framework of sustainability, responsible management of other resources values, and consideration/acknowledgement of public concerns.	The report states that the harvest objective was met with some deviation. Approximately 51% of the planned volume and 52% of the planned area was harvested. Achievement of planned harvest volume by species was: Spruce: 50% Jack Pine: 92% Balsam: 55% Poplar: 55% Birch: 5%	The harvest objective was not met and, arguably, only one of the measurable strategies within the harvest objective was met. The dramatic shortfall in performance was attributed to markets and fires. The Company intended to harvest 8,881 ha of overmature forest. They actually harvested only 2,861 ha, but an additional 14,565 ha were burnt in fires.
Utilization: To increase the utilization of market fibre from available resources by all licensees.	The Company states that the use of in-block chipping has increased overall utilization and has made operations viable in many low volume stands. Strategies also included increased utilization of cedar, larch, and birch; actively pursuing development	The auditors viewed many sites where chippers had been used. The percentage of blocks where chipping had occurred was not determined. Chipped blocks frequently had smaller stumps or downed residual, suggesting a low volume pre

Objective	Achievement	Comment
	of commercial thinning operations; and actively soliciting third party operators to harvest underutilized species.	–harvest condition. The objective has been addressed, although its overall success has been compromised by the low harvest rate on the Forest.
Renewal and maintenance: To implement a silvicultural program that is capable of producing and maintaining a sustained supply of marketable fibre from the BSF.	Renewal targets were not met due to the underachievement in harvest. However, area renewed was greater than the area harvested.	The Company renewed 6,354 ha of natural (33% of target) and 17,936 ha of plantation (66% of target). The total land renewed was 53% of that planned, slightly exceeding the area harvest performance. The Company implemented or partially implemented 14 strategies to support the target and objective. However, most of the burned area was not regenerated. This objective has been partially met.
Integrated resource management: To coordinate timber management activities so that commercial and recreational forest uses are addressed and potential conflicts minimized.	Cooperating with OMNR and applying the guidelines as they emerged helped meet this objective.	This objective has been met. Twelve strategies are explained in the RPFO, ranging from conformance to public notification requirements to following applicable moose guidelines. The Company has implemented each of the strategies.
Environmental Quality: To implement all forest management activities in a manner that will protect and maintain environmental quality, consistent with approved policy and guidelines. To minimize negative impacts and ensure that mitigative action will take place through sound environmental practices in strict accordance with environmental legislation.	Adhering to all applicable legislation and guidelines ensured the achievement of this objective.	The Company met this objective. Nine strategies were created to support this objective, and all were completed.

The Company did an excellent job of examining and presenting the objectives, targets and strategies in the RPFO. The objectives themselves, originating in the 1996 FMP, were relatively unfocussed and hard to quantify. That is not atypical for objectives that

were created 10 years ago. The targets and strategies were well defined. Most were directly related to the objectives and most had measurable indicators.

The assessment of performance in meeting the objectives was well done. The RPFO identifies that both harvest and renewal objectives were not met. Harvest shortfalls are broken down by species, area, and volume. The reasons for the shortfalls are bluntly discussed later in the RPFO. Harvest operations were delayed as harvest amendments were processed allowing the salvage harvest of areas consumed by 66,000 ha of fire. The spruce budworm reduced the marketability of many stands and hardwood markets, particularly for birch, did not materialize. Volumes that were declared surplus on the Forest were not harvested, either because they were not made available to operators on the Forest, or the operators did not have an interest in harvesting the surplus wood. The RPFO also notes that union negotiations periodically restricted wood flow. The RPFO cites the 2001 IFA recommendation to improve timber merchandizing on the Forest in support of improving performance against the harvest objective.

Regeneration targets are directly related to harvest. Therefore, it is not surprising that renewal targets were not met. The Company renewed more area than they harvested, largely due to the replanting of burned areas. However, much of the area consumed by fires was not regenerated. Where renewal was done, it was largely successful. Ninety-three percent of the planned FTG target was met.

Other objectives were met. Where harvest and renewal did take place, they did so within the rules and polices identified in the 1996 FMP.

The 2001 FMP for the BSF established four objectives as required by the 1996 FMPM. The objectives were:

- Forest diversity;
- Social and economic matters;
- Provision of forest cover; and
- Silviculture.

The forest diversity objective has three sub-objectives, each with associated targets and strategies for achieving the targets. There are 10 sub-objectives for the social and economic matters objective, five sub-objectives supporting the provision of forest cover, and four sub-objectives that address silviculture.

An assessment of the objectives and targets from the 2001 FMP are reviewed in Table 5.

Table 5. Auditor comments regarding 2001-2006 forest management plan management objectives.

Objective A – Forest diversity objective. The forest diversity objective has three sub-objectives.

Sub-objective	Target	Achievement	Comment
To conserve long-term forest biodiversity.	– Stay within natural bounds of variation for diversity indicators. – Maintain or increase red pine, white pine, cedar, and white spruce. – Maintain levels of available preferred habitat for selected wildlife species. – Maintain the amount of Crown forest available for timber production. – Move towards a more natural disturbance size class and frequency distribution.	– The 2001 FMP set the parameters for meeting this objective. – No summary evidence was reviewed to confirm minor tree species targets are being met. The audit team observed red and white pine as minor components of several plantations. – The production forest area has decreased by 5% over the last five years. Large fires over 66,000 ha, an area that is about 15% of the total production forest, occurred between 1996-2001. – The large fires and budworm-caused mortality are moving the forest towards a natural frequency distribution.	This sub-objective is being met. Large natural disturbances (fire and budworm) are overshadowing harvest as determinants of the future forest condition.
To minimize the impact of forest operations on the physical environment.	– Minimize the impact of forest operations. – 100% compliance with environmental laws and regulations. – Zero instances of environmental degradation due to forest operations.	The Company reported 39 incidents of non-compliance in the 2001-2006 period. They have not met their target of 100% compliance, but their program is effective. There are no reported incidents of forest degradation due to operations.	This sub-objective has been met. The Company's compliance program does an effective job of monitoring forest operations. Field observations confirmed that access, harvest, and renewal and tending operations are completed with predicted and acceptable impacts on the physical environment of the Forest.

Sub-objective	Target	Achievement	Comment
To ensure that red and white pine forest ecosystems, including old growth stands, are present on the landscape now and in the future.	- To maintain or increase the occurrence of red and white pine on the Forest. - To plant 100,000 seedlings per year of red and white pine, along with required vegetation management. - To protect the Shook Lake Conservation reserve in accordance with the Conservation Strategy for old growth red and white pine forest ecosystems for Ontario.	- Summary evidence was not reviewed to confirm that 100,000 seedlings had been planted. - Red and white pine plantings were noted in virtually all of the artificially regenerated upland sites visited. - The Shook Lake Conservation reserve was protected.	The auditors conclude that this sub-objective is being met, even though summary evidence on red and white pine planting was not viewed. Plantings of pine were observed in suitable locations, and mature white and red pine were left as seed trees.

Objective B – Social and economic objective. The social and economic objective has 10 sub-objectives.

Sub-objective	Target	Accomplishment	Comment
To provide a sustainable, efficient, and economical supply of timber to the local forest industry and to promote optimal utilization of the available wood products.	- To make 450,000 m^3 of softwood available annually. - To make 261,000 m^3 of poplar available annually. - To make 28,000 m^3 of birch available annually.	- 374,000 m^3 of softwood was planned for harvest. - 235,000 m^3 of poplar was planned for harvest. - 176,621 m^3 of birch was planned for harvest.	The sub-objective was not met. It appears as though the target was too high for softwood. This was not a factor during the plan period, as less than half of the planned volumes were actually harvested. The target would not have been met even if the planned volumes had been harvested.
To make local employment opportunities in the forest industry.	To maintain and promote local jobs and businesses in all communities local to the forest.	Bowater supports independent businesses in virtually all aspects of their operations. Planning, GIS services, and compliance inspections are all examples of independent businesses that have been engaged.	This sub-objective is being met. The Company uses local companies in all phases of its forest operations.

Sub-objective	Target	Accomplishment	Comment
To provide a continuous and predictable flow of wood products to the following mills: Bowater Inc, Northern Sawmills Inc., Buchanan Northern Hardwoods, and Weyerhaeuser Canada Ltd.	Plan for a relatively even flow throughout the planning terms and throughout the seasons for forest operations.	The auditors' interviews with listed recipients of wood from this forest confirm that all parties are getting as much wood from this forest as needed. Harvest has not met targets for the last 15 years.	There has been an even flow of wood planned for, so this sub-objective is being met. The fact that the planned area of volume harvested has not come close to actual indicates there has been more wood available than is required for the listed mills.
To make available incidental volumes of timber for uses such as firewood, building logs, fence posts, and other materials for personal or other use.	Make available incremental volumes of timber to meet personal use and local wood requests.	The auditors interviewed Bowater and OMNR staff. Firewood permits for the forest were not reviewed.	No direct evidence was reviewed that would confirm this objective was being met. Discussions with staff confirmed the process for making this wood available.
To work with Chief and Council of First Nations Communities within or adjacent to the BSF to identify and realize benefits to Aboriginal people through forest management.	Maintain regular open communications between Bowater, OMNR, Chief and Council of: Gull Bay First Nation, Red Rock First Nation, Sandpoint First Nation, Whitesand First Nation, and Fort William First Nation.	The Company has a dedicated contact person for First Nations and has established a record of consistent communications.	This sub-objective is being met. Detailed comments regarding relations with First Nations are presented in Section 3.2.3 of this report. Opportunities to use surplus wood from the Forest are discussed.
To salvage timber from natural disturbance events.	To promptly assess every significant natural disturbance event for economically and ecologically sound timber salvage opportunities to minimise loss of merchantable timber within parameters of biodiversity conservation.	Fires and budworm damage have been promptly assessed. They have been dominant disturbances on this forest. The Company has aggressively sought funding to replant plantations. Salvage harvest has been conducted aggressively.	This sub-objective is largely being met. Burned areas are harvested where possible and the Company's use of chippers has increased the feasibility of those operations. Most of the naturally depleted areas have been surveyed for loss or renewal.
To plan, implement, and	Meet the intent of the resource based	The Company has a designated staff	This sub-objective is being met.

Sub-objective	Target	Accomplishment	Comment
monitor forest operations in a manner that maintains the economic viability of the resource based tourism industry established on the BSF.	tourism policy and thereby ensure no tourism business is lost due to forest operations.	member that has worked diligently to secure business-to-business agreements with resource based tourism operations.	Dialogue between the Company and tourism business appears to provide adequate consultation.
To maintain or enhance commercial, resource based, non-timber harvest operations.	Maintain or enhance current levels of opportunity for commercial, non-timber harvest operations.	The Company and OMNR consider the needs of trappers, tourist operators, and other non-timber forest users in locating roads and developing road abandonment plans.	This sub-objective has been met. Discussions with non-timber users are common as part of FMP and AWS consultations.
To maintain road accessed recreation opportunities while protecting non-timber values.	- To maintain or enhance current levels of opportunities through road development. - To access areas planned for harvest. - To develop access where harvest is planned for the next 20 years.	The access planning process has provided suitable notice for recreationists to plan their trips.	This sub-objective is being met.
To maintain or enhance mining and mineral exploration opportunities on the BSF.	To maintain and enhance current levels of opportunity for the mining and mineral exploration industry.	Roads abandonment practices meet the intent of this sub-objective.	A review of the roads abandonment strategy as implemented confirmed the sub-objective is being met.

Objective C - Provision of forest cover. The forest cover objective has five sub-objectives.

Sub-objective	Target	Accomplishments	Comments
To maintain/enhance/create a forest landscape pattern that will supply suitable habitat for marten over time and within the bounds of natural variation.	Maintain a landscape composition and structure suitable for the maintenance of healthy populations of marten as described in the *Forest Management*	Marten corridors have been identified in the long-term plan, but the Forest does not currently support habitat that would meet requirements. In the Current	It will be difficult to meet this sub-objective on a forest that has such a long history of harvest and is so prone to natural disturbance. The Company is planning to create

Sub-objective	Target	Accomplishments	Comments
	Guidelines for the Provision of Marten Habitat.	River Parcel, which has a long history of harvest and access, marten guides may never be met.	more habitat that will meet marten guide requirements, but it is not likely they will address this sub-objective completely.
To protect forest cover that is currently used as critical habitat by eagles, osprey, and heron.	No loss of nests or nesting success as a direct result of forest management activities.	Compliance reports and inspections of sites on the audit showed no loss of nests. Interviews with the biologists on the Forest did not suggest nesting success had been compromised. The Company's EMS handbook directs staff to report any unmapped values to the supervisor.	This sub-objective is being met. The Company takes care in planning their operations and operational staff and contractors are aware of operational restrictions around unmapped values such as bird nests.
To maintain/enhance/create a forest landscape pattern that will supply suitable habitat for moose over time.	– Maintain or enhance moose habitat on the Forest. – Increase the available late winter moose habitat.	Critical habitat has been identified and protected through AOC prescriptions. Moose wintering areas have been identified and are incorporated into harvest blocks.	The sub-objective is being met. The audit viewed many moose blocks and they were laid out as planned. It did seem odd that they are still square.
To maintain the presence of woodland caribou by developing a forest landscape pattern that will ensure a suitable and sustainable year-round caribou habitat supply, distributed temporally and spatially over the landscape.	Maintain a continuous range occupancy for caribou in the Caribou East Parcel of the Forest.	The planning process has been adapted to implement a caribou mosaic in the northern part of the BSF. Harvest areas have been reviewed to confirm status of caribou following sightings near Lake Nipigon.	This sub-objective is being met. Caribou are an active consideration in planning and harvest deferrals have occurred until status of caribou sightings is confirmed.
To ensure the protection of fish habitat.	Achieve no net loss of fish habitat as a result of forest management activities and, where possible, achieve a net gain for fisheries resources.	The Company has a well-defined procedure for planning water crossings and operating near water. Compliance reports and auditor observations did not indicate harm to aquatic habitat.	This sub-objective is being met. Operations typically leave buffer zones around streams that are wider than required. This offers a theoretical increase in protection to fish habitat.

Objective D – Silviculture. The silviculture objective has four sub-objectives.

Sub-objective	Target	Accomplishments	Comments
To maintain the long-term production of timber while maintaining the ecological diversity of the landscape.	Maintain or enhance the area and quality of Crown forest available for timber harvest.	The strategies for meeting this sub-objective are well defined and effectively implemented. The Company is monitoring its regenerating forest. Natural disturbances have been larger than harvest depletions over the last 10 years.	This sub-objective is being met, particularly on harvested areas. Areas depleted due to fire have had more silvicultural treatments than would normally be expected. FTG surveys monitor the re-growth of depleted areas.
To ensure the renewal program is effective, efficient, and economical.	Select ecologically sound silvicultural strategies that keep expenditures in line with accruals in the Forest Renewal Trust Fund for the BSF.	Renewal strategies are well defined. The Company has renewed more area than it has harvested during the planning term, which is uncommon. The Forest has been stratified on the basis of silvicultural intensity zones. This provides guidance, based on site type and location, to the level of silviculture that should be implemented.	This sub-objective is currently being met. The auditors observed some sites that were marginally successful in terms of renewal and, through discussions, confirmed that the Company is minimizing renewal expenditures as part of overall cost management. Continued reduction in expenditures will ultimately harm the sustainability of the Forest.
To ensure that all regenerated area is accounted for and the inventory is kept current with FTG or status information.	– Capture all FTG areas into the forest inventory annually. – Update depleted areas due to fire/ insect/ harvest.	The strategy for meeting this sub-objective is well defined and has been implemented effectively.	This sub-objective has been met. The Company has improved performance at tracking naturally regenerating stands and maintains a monitoring effort until stands are declared FTG.
To ensure the revitalization of stands damaged by spruce budworm.	Increase harvest levels and renewal of stands significantly damaged by spruce budworm.	The last budworm outbreak was in the late 1980s. Some 25 years later, the BSF is still dealing with the consequences of an	The Company is making reasonable progress in meeting this sub-objective. Many of the budworm damaged stands contain

Sub-objective	Target	Accomplishments	Comments
		insufficient protection program.	low commercial volumes and are not economically viable, even for chipper operations. These areas will default to natural regeneration and a slower recovery timeline.

The Company has done an excellent job of laying out clear objectives, sub-objectives, targets, and strategies in the 2001 FMP. The targets are normally measurable, and the strategies for meeting the targets are sensible.

The Forest is being chronically under-harvested and has been since 1991. This is the most significant shortfall in implementing the objectives from the 2001 FMP. At this point, the under-harvest is a clear trend and represents a lost economic opportunity in the 15-year term. It also represents, in the case of naturally depleted stands (i.e., budworm-damaged or burned stands), a decaying ecological opportunity.

There was not a consistent cause for the failure to meet harvest targets over the last three planning periods. The 1991-1996 period was dominated by a shift of harvest activity to complete salvage operations on forest areas killed or depleted by spruce budworm defoliation. The 1996-2001 period was dominated by salvage activities on areas depleted by large fires. Harvest activity during the most recent operating period has been driven by poor markets.

Under-harvesting affects all values in the Forest, interrupting the scheduled renewal of forest habitat and challenging the fundamental basis of the long-term ecological planning system that is the backbone of Ontario's forest planning system. The magnitude of the shift in harvest allocations over the 15-year period is the largest challenge to the assessment of sustainability on this forest.

The audit team's interviews with commitment holders for the wood found all mills to be satisfied with the volumes of wood delivered from this forest, suggesting that reduced harvest was not critical to the survival of any local mills. In fact, the shifting of harvest from planned to salvage areas, and the reduction of harvest overall, may improve the wood supply and habitat supply on this forest over the long-term. The fact that it is not known if under-harvesting is a net benefit or detriment to the BSF is the principle concern. There is an urgent need to quantify the impact of under-harvesting and improve performance if possible.

Given that, OMNR and the Company must conduct a strategic review of harvest and allocations on this forest. The review should confirm that companies currently holding commitments need the timber volumes assigned. The review should ensure the harvest and timber allocation system is flexible enough to react to changes in planned activities. Harvest opportunities that cannot be realized by planned commitment holders should be marketed aggressively. A better effort is required to ensure timber harvest and habitat renewal on the BSF meets the targets detailed in the FMPs.

Recommendation 22: District OMNR and Bowater shall conduct a review of area and volumes harvested on the Black Sturgeon Forest over the past three planning periods, to determine if there is potential to develop markets for timber that is not being utilized.

3.7.2 Review of RPFO Assessment of Sustainability

The 1996-2001 RPFO correctly states that the five forest sustainability criteria, which must be monitored by SFL holders, could not be assessed at the time the RPFO was written. The period that the RPFO assessed included plans for which sustainability was not assessed, and, even for the most recent plan considered, could not be completely assessed. However, the report does a commendable job of providing an alternate analysis. The trends in sustained wood fibre forecasts, relative abundance of landbase over time, changes in forest composition and age class structure over time, area harvested, and area regenerated have been evaluated.

The sustainable harvest projection dropped 10% between the 1991 and 1996 evaluations. The RPFO attributes the drop to calculation methodology. More recent calculations from wood supply models, that include natural depletions, indicate a large decrease in wood supply beginning in the next 10 to 20 years and lasting for 40 to 60 years. The 2006 FMP suggests that harvest will stabilize in about 50 years, after which a harvest of about 5,000 ha (700,000 m^3) is maintained for the next 100 years. This level is about 25% less than what is forecasted for harvest in the current planning period. The RPFO states that a definitive statement on sustainability cannot be made based on current information.

The production forest area on the BSF has declined by 20,700 hectares (4.6%) since 1991. Reductions from the OLL allocations were offset by the additions of the Caribou East Parcel and the McIntyre Peninsula. The reduction will result in less harvest being available into the future.

The RPFO reports changes in forest composition over the 10-year period assessed. The report cautions that some of the change may be an artefact of a new, more accurate inventory. Stands dominated by spruce increased from 102,000 ha to 139,000 ha, birch stands increased from 80,000 ha to 102,000 ha, balsam fir declined from 80,000 ha to 5,000 ha, and the forest typed as B&S declined from 52,000 ha to 42,000 ha.

The largest influence on age class change has been fires, which caused reductions in the 41-60 and 121-140 age classes.

The RPFO suggests the change in forest composition may indicate a move towards a "forest that is more productive and less susceptible to budworm." The RPFO looks towards the next RPFO to complete an age class and composition analysis to confirm that the BSF is approaching a desired state that is within the normal bounds of natural variation of age and composition on a forest.

The RPFO examines the ratio of harvested area against the area renewed. Ideally, the ratio should be 1:1, as every hectare harvested should be renewed. The RPFO shows a total of 87,011 ha depleted between 1991 and 2001, of which 66,000 ha were lost due to fire. The Company actively renewed (through planting of softwood) 17,936 ha and designated a further 6,354 ha as natural regeneration during the same period. Renewal exceeded harvest by 3,400 ha or 16%. This success rate is consistent with the Company's

performance during the previous five-year period (1991-1996), when just over 100% of the harvest area was renewed. However, renewal during the 2001-2006 period only amounted to 27% of the total area depleted.

The gap is explained entirely by the large area depleted by fire that was not actively renewed. This 66,000 ha loss, amounting to 14% of the forest area, will need to be surveyed in the near future to determine the condition of these regenerating stands. Assumptions about the future habitat and wood supply will be challenged if the recovery of this area is not accurately monitored. The auditors recommend that the Company implement early assessments of this area.

Recommendation 23: The Company shall monitor recovery of areas burned during the 2001-2006 term, to confirm renewal rates and condition of timber and habitat.

The 1996-2001 RPFO shows a total of 38,324 ha assessed for renewal success, of which 29,519 was declared FTG. The previous term (1991-1996) showed 92% of the 54,779 ha assessed were successful in reaching FTG status. When considered collectively, some 79,000 ha were successfully regenerated over the 10-year period, when the area harvested was approximately half of that. The audit team is satisfied that the silvicultural effort on the BSF, as reflected in the RPFO, is successfully regenerating harvested areas.

The RPFO author has done an excellent job of conducting this analysis. Information gaps are identified and a long-term perspective, based on both harvest and natural depletions, has been introduced

The RPFO concludes that, within the limits of the information available, "...the forest sustainability for timber production does not appear to be in jeopardy...". With the caveat that natural depletions must be carefully monitored in the near future, the audit team agrees with this assessment.

3.7.3 Review of Comparison and Trend Analysis of Planned vs. Actual Forest Operations

As part of the requirements for the IFA process, the Company has collated information from the previous two and the current planning periods (1991-2006 inclusive) for the BSF, in order to provide trend information on forest sustainability. The Trend Analysis report submitted by the Company was received in good order and provided reasons and rationale for trends. The auditors used this report and the Annual Reports produced during the audit term to support their analysis of sustainability. The figures used in all of the Trend Analysis tables have been annualized to facilitate more meaningful comparisons.

The entire Trend Analysis, as submitted by the Company, is included in Appendix A of this report.

The long-term size and composition of a forest defines the ability of forest managers to address ecosystem changes. The larger the forest management unit, the more opportunity there is to implement activities that result in large scale changes to the environment.

As noted in the discussion above, the BSF had a slight reduction in production area managed over the 15-year period considered. The total production forest decreased by 4.6 %. The net change was a result of additions and deletions from the SFL. The additions include the Caribou East Parcel that was added after the formation of Wabakimi Park and the McIntyre Peninsula. Deletions are attributed to lands set aside in the OLL process.

The B&S lands were reduced by 48% from 1991 to 2006, largely due to a new inventory. Changes in how B&S lands were tracked accounts for some of the difference. As of 2001, B&S lands accounted for 30% of the total production forest. This has been reduced to 25%, as of 2006. Both numbers are a significant increase from the 12% listed in 1991.

The standing inventory was reduced between 1991 and 2006 (from 82% of the production forest to 70% of the production forest). This is largely attributed to 66,000 ha of fire that occurred in the 1996-2001 period.

Changes in forest composition in terms of tree species were subtle, with the exception of balsam fir. Stands dominated by balsam fir declined from 88,000 ha to just over 3,000 ha, a precipitous drop attributed to spruce budworm. Jack pine increased by 18%, spruce increased by 9%, and poplar changed by less than 2%. All of this increase was attributed to an updated inventory that reclassified stands from B&S to productive forest types. The land that remains B&S will obviously affect the species composition of the Forest as it grows into a FTG category and is classified.

There is a current shift in the amount of forest categorized as hardwood versus softwood over the 15-year period considered by the Trend Analysis. Conifer made up 61% of the Forest for the 1996 and 2001 plans. That has been reduced to 53% in the 2006 plan. The change was attributed to fires, which burned conifer stands disproportionately, and spruce budworm caused mortality, which normally results in stands appearing to be dominated by hardwoods. The conversion is noted as being short lived, as regeneration surveys indicate that the proportion of regenerating softwood forests approaching FTG status is substantially larger than hardwood.

Forest units describe how forest stands are categorized for management purposes. Table 2 in the Trend Analysis (*Description of Forest Units*) describes the forest units that were used for the 1991-1996, 1996-2001, and 2001-2006 five-year planning terms. The number of forest units was increased from seven in the 1996-2016 FMP to nine during the 2001-2021 FMP and 13 in the 2006 FMP. The current forest units are now consistent with those used across the Region, and should allow for meaningful assessment into the future.

Planned versus actual harvest volumes is detailed for each of the three planning terms. Harvested volume was 60% of that planned for the 1991-1996 term, 53% for the 1996-2001 term, and 46% for the 2001-2006 term. The text in the report addresses the declining harvesting performance. Harvest shortfalls are attributed to a variety of causes. In the 1991-1996 period, harvest was chasing budworm damaged stands and negotiations with Gull Bay First Nation slowed down operations. In 1996-2001, large fires compromised harvest. The current plan, 2001-2006, saw a large contractor stop work on the Forest.

There is some comfort that the under-harvest is happening for a variety of reasons, as opposed to one or two consistent causes. On the other hand, the reduction in harvested volume and area has been consistent for at least 15 years. A previous recommendation in this report suggested OMNR conduct a strategic review of harvest on the BSF, with a view to increasing the markets available for the fibre from the Forest and examining the means to bring actual harvest in line with planned volumes and areas.

Field observations indicate regeneration has been conducted effectively on this forest. The area renewed is actually higher than the area harvested, due largely to efforts to regenerate following fires. The total area regenerated is coincident with the total area harvested for the last three planning terms. It falls short of the total area depleted during the 15-year period, which raises a concern, as noted in Section 3.7.2 of this report. The significant increase in the amount of B&S lands on the forest represents a large portion of the Forest that is renewing itself naturally. It will be important for the SFL holder to monitor the recovery of these stands carefully to ensure assumptions used to assess the long-term state of the BSF are accurate.

Table 7 of the Trend Analysis (*Harvested Area Successfully Regenerated*) shows the Company has surveyed an area equivalent to that harvested in 1991-1995 (22,648 ha) for FTG and found 82% has met FTG standards. The analysis explains the 18% shortfall (2,787 ha) by attributing unsuccessful areas to late in-term seeding sites, which might reasonably be expected to grow sufficient height to meet FTG standards during the next term; areas that had been regenerated during the 1991-96 period, but were burnt in the 1996 fires, effectively restarting the regeneration clock; errors in mapping harvest depletions originally; and errors that could be categorized as data merging problems (3% by area) while generating the 1996 FRI.

3.7.4 Achievement of Forest Sustainability

The CFSA defines as its purpose "to provide for the sustainability of Crown forests and in accordance with that objective, to meet social, economic and environmental needs of present and future generations." It further states that determination of sustainability shall be consistent with two principles. They are:

- large healthy diverse and productive Crown forests and their associated ecological processes and biological diversity shall be conserved, and;

- the long-term health and vigour of Crown forests should be provided for by using forest practices, that within the limits of silvicultural requirements, emulate natural disturbances and landscape patterns while minimizing adverse effects on plant life, animal life, water, soil, air and social and economic values, including recreational values and heritage values.

This audit, as directed by the IFAPP, puts great weight on the assessment of the planning and performance of activities relating to timber extraction and how it influences the environment. The audit team has concluded that these activities are being conducted as planned, and the forest environment is responding as predicted. Timber extraction is completed in a manner that supports the sustainability of the environment on the BSF.

Evidence to support these statements start with an assessment of impacts on the soil. Road construction has the greatest impact on soils. The act of building a road results in complete removal of topsoil, compaction of the surface and subsurface layers, and the creation of a site that supports greatly retarded and modified vegetation. The impacts are obviously greatest on primary roads, diminish as the roads become less permanent, and are barely detectable on winter access only roads or on block skid trails.

Given that roads provide the only realistic access to timber and that their impacts are, therefore, accepted as a matter of realizing the economic benefits associated with timber extraction, it is reasonable to assume planning roads in a careful manner minimizes the impacts. The auditors reviewed access planning on the BSF and found it to be very well done. The planning process in Ontario requires primary road corridors be identified 20 years in advance and secondary corridors five years in advance. The SFL managers did this. Further, the actual sighting of roads directly benefited from an evaluation of potential impacts on fish, wildlife, and other forest users through the planning process. The audit team concludes that planned roads on this forest are located in a manner that reduces their impacts on the forest environment to an acceptable level.

Road construction and maintenance in the Boreal Forest inevitably means crossing streams and rivers. Poorly constructed or maintained roads can become a chronic contributor of sediment to streams, and can fundamentally change the stream habitat in doing so.

The audit team specifically inspected 27 water crossings or water crossing removals and reviewed compliance reports from the five-year period of the audit. The slopes leading to the crossings were well planned and managed. There will be some contribution of sediment to streams over time but, on the crossings inspected, the opportunity for sedimentation was acceptably low. Water crossing removals had been bermed, sloped, and re-vegetated. Water crossings themselves, both culverts and bridges, were well constructed.

Harvest on this forest frequently was conducted to salvage fibre from burns, and salvage harvests operate under reduced AOC requirements. It might have been reasonable to expect to see a higher site disturbance because of this. In fact, none was noted.

Significant rutting was not observed anywhere on the Forest and the harvest operations did not have observable impacts on the soils.

The temporal perspective provided by viewing the recovery of vegetation on sites in the FTG stage, which typically occurs 10 to 15 years post harvest, convinced the audit team that soil disturbance on harvest sites has a minimal effect on the forest soils. In every case, soil disturbance on harvest sites was less than that observed on sites that had been severely burned during wildfires.

The impacts of harvesting on water quality were assessed both at water crossings and on harvest sites adjacent to aquatic habitat. Comments on water crossings are noted above. Operations adjacent to aquatic habitats were consistently within practice standards established for operating in riparian zones. Buffer zones around streams were wider than required, most commonly as a matter of providing protection to streams that had not been surveyed and, therefore, defaulted to cold water stream protection standards. The audit team physically walked through the riparian vegetation to the high water mark on 12 sites to assess the integrity of the protection provided to the riparian zones. In all cases, the streams were left with sufficient vegetation to mitigate potential erosion from harvest sites and to provide shade to the streams to mitigate changes in water temperature.

The Company had planned harvests where exceptions to the riparian guides had been created through cut-to-shore prescriptions. These were not implemented in this audit period. The auditors encourage the Company to move forward with this activity, as it stands a good chance of improving economic return on harvest efforts, as well as selectively renewing riparian habitat.

In summary, the audit team found no evidence that timber management operations on the BSF had a negative effect on water quality.

The recovery of vegetation following timber harvest is well documented through normal operational records. The forest types harvested on the BSF have evolved through a history of natural disturbances and are naturally resilient. All sites inspected that had been prescribed for natural regeneration were growing back as expected. Planted sites were growing softwood and, depending on tending treatment, had sufficient hardwood, shrub, and forbs to maintain vegetative diversity. Tracking areas from harvest to new stand establishment provided compelling evidence that the vegetation on this forest is recovering as planned and at a rate that was consistent with that predicted. The harvested forest is being replaced in a manner that ensures a sustainable and predictable supply of timber types and the habitat those timber types represent.

The audit team is concerned that deferred contributions to the BSF silvicultural trust funds may limit the ability of the forest manager to continue to regenerate the Forest effectively. This has been addressed in audit findings in Section 3.8 of this report, *Contractual Obligations*.

The audit team discussed wildlife management on the BSF with two of the wildlife biologists working on the forest. Timber harvest planning in Ontario is nested within a forest management framework and, as such, all proposed harvest areas are evaluated spatially and temporally to assess its effect on wildlife habitat. The aspatial analysis conducted as part of the forest management planning process tests for the provision of suitable habitat for moose, wetland and terrestrial furbearers, marten, black bear, eagle, osprey, heron, other raptors, songbirds, cavity nesters, and caribou. These species have effectively been used as indicators for other species that occupy similar habitat on the forest. Harvest is managed so that there is sufficient habitat for each of these species on the forest for a planned period of 100 years. Sufficiency has been defined by OMNR as provision of habitat area within 20% of the bounds of normal variation.

This approach assumes that if suitable habitat is provided on a continuous basis, populations of species will occupy that habitat continuously. In that sense, current operations and planned operations on the BSF will provide a continuous and predictable supply of habitat on the Forest in a sustainable manner, therefore, ensuring a continuous population of species on the Forest.

It is a challenge to confirm that the individuals that make up populations of all these species actually continue to occupy the habitat deemed suitable for them. The auditors viewed very little information that confirmed the abundance of wildlife species on the BSF and, in fact, the information for most species is not available. This is also outside the scope of this audit. It would be very beneficial for OMNR to continue to quantify the status of wildlife populations on the BSF, in order to improve management capacity.

The BSF does not currently have sufficient area to meet the requirements of the *Forest Management Guidelines for the Provision of Marten Habitat* (OMNR 1996b). The guidelines require a minimum of 10% of the forest have suitable conditions for habitat. The BSF currently has 8% of marginally acceptable area and the prospects for improving it are moderate at best. This forest has been extensively harvested since the 1920s and the large, contiguous areas favoured in the marten guide will be difficult to develop. The marten guideline requirements were first published in 1996 and, in the near term, it will not be possible to correct the historical and fragmented harvest pattern to meet the guideline's requirements for core areas between 30 and 50 km in size. The audit suggests some tactical improvements, which will help to generate additional softwood dominated areas. The lack of marten areas is, however, a larger problem on this forest, and it may well be that the minimum standard is never achieved. The auditors do not view this as a significant impact ecologically. The Forest, taken in a regional context, will still contribute suitable marten habitat and all of the species and ecological functions that depend on marten habitat will be present into the foreseeable future.

The harvest of timber on the BSF is a concern. The history of natural disturbances on the forest, caused by the spruce budworm outbreak in the 1980s and large forest fires in the 1990s, have added to an age class imbalance on the Forest. The calculated sustainable timber harvest levels will decline for the next 50 years. The Company, based on an evaluation of their timber supply projection calculations, has properly accounted for this

projected shortfall and, because of this, have met the test of supplying a sustainable and predictable flow of timber into the future.

This predicted reduction in wood supply will result in reduced economic benefit that can be derived from the BSF and this is acknowledged by the Company and in the 2001 and 2006 FMPs. There is a concern that this predicted reduction in economic benefit will be exaggerated if the Company and OMNR do not improve performance in utilizing planned harvest. It is apparent that the forest planned for harvest for the next 20 years is the same mature forest that is most vulnerable to further losses by fires, insect, or windstorm. This audit has recommended that OMNR and the Company conduct a strategic review to evaluate why actual harvest levels have been below planned harvest levels for each of the last three terms. The auditors view this as the most significant recommendation of this audit, and urge the Company and OMNR to conduct this review aggressively. It is important that performance in harvesting be improved to create the predicted opportunities for economic benefit.

The ecological components of the BSF that are most likely to be influenced by forest operations are being managed in a sustainable manner. The audit team is confident that the ecological integrity of this forest, if managed as is currently planned, will be maintained for the benefit of future generations as proclaimed in the CFSA.
The CFSA also speaks to sustainable social and economic benefits from the forest. The premise of the audit team is that if the ecological integrity of the forest is sustained, the opportunity for social benefit will be maintained as well. The audit team has noted a concern about under-harvesting, and this must be strategically addressed. Although discussions through the audit with First Nation peoples, recreationists, tourist operators, and others clearly indicated that the Forest is commonly used for reasons other than timber extraction, the audit protocol does not lead to a significant evaluation of the social use of the Forest.

The auditors conclude that the Forest is being sustainably managed with some reservations. Evidence reviewed confirms management is being completed in a manner that meets expectations. Factors on this forest that can be controlled by current managers are being managed within terms and conditions defined by the CFSA, its regulations and policies. In that sense, the audit team states that this forest is being managed in a predictable and sustainable manner.

There is no doubt that the combination of historical harvest patterns and more recent natural depletions have challenged the ability of this forest to meet current expectations for large blocks of contiguous, mature forest. Over 30% of the forest is less than 20 years old, and less than 60,000 ha of this forest are more than 80 years old. The management of the forest considered the need for larger mature forest areas, but it is clear that they will not be present on this forest for some time. This is entirely due to a need to grow this habitat, rather than protect this habitat. It will take the Forest some time to grow a large area of mature forest. In that sense, the audit team confirms that the Forest will not meet all of its intended ecological targets for some time into the future.

Ecological issues are identified and corrective plans are in place. The Forest will provide a predictable supply of timber and, although it will be less in the near future than has been available in the recent past, recovery is predicted. The auditors conclude that management on this forest is done in a manner that will ensure ecological sustainability over the long-term.

3.8 Contractual Obligations

The BSF is currently managed under the terms of SFL #542500, which was initially approved May 9, 2001 and most recently amended March 1, 2006. Within the SFL, Bowater has a number of contractual obligations that must be fulfilled. This section reviews the Company's success in meeting their obligations.

The 2001 IFA report for the BSF included 31 recommendations directed at the Company and OMNR. The Action Plan developed in response to the audit was approved on June 2, 2003. The Action Plan Status Report was 14 months late and was delivered to the Audit team at the opening meeting of this audit. Both had a number of problems that resulted in delays. First and foremost was the nature of the recommendations from the last audit. Many were substantive and required significant organizational commitments from both OMNR and Bowater to develop sensible responses. Some of the issues were administrative. For example, the lead OMNR District had five different foresters assigned to the BSF since the last audit.

The last two audits have made explicit recommendations to consolidate the administrative process on the BSF. Two districts, four biologists, two or three foresters, a large planning team, three LCCs, and a disjointed geography have resulted in a remarkably nonsensical SFL. There is no apparent progress on the recommendations that have now been requesting OMNR action for more than 10 years. This audit team regards the indifference to these recommendations as the most significant cause of the delayed response to the last audit. Because of this, the simple recommendation to have the reports submitted within the required timelines seems useless. This audit recommends, for the third time in three audits, that OMNR streamline their administration of the BSF.

Recommendation 24: District OMNR is to consolidate administration of the Black Sturgeon Forest so that the SFL holder reports to one OMNR District and one Local Citizens' Committee.

According to the Status Report, the Company and OMNR have acted upon the recommendations and Action Plan items from the 2001 audit. Recommendations within the purview of the Company or District office have been addressed. Several are ongoing, and in all cases the rationale provided in the Action Plan Status Report justifies this.

Specific progress was noted through improvement in the operational performance of Niigaani Enterprises Inc. The audit team confirmed operations conducted by Niigaani Enterprises Inc. were fully acceptable. In addition, the Districts and the Company made

efforts to improve the effectiveness of the FMP open house process and the NRVIS collection process. Nipigon District improved its efforts to consult with the Gull Bay First Nation. The Company created a new operational procedure to minimize the size and impact of chipper piles.

OMNR rejected the recommendation to improve provincial oversight of the FMP process. The OMNR comment stated that current oversight was sufficient.

Examination of the Forest Renewal Trust Fund account, and the record keeping required to support it, found full compliance with the license requirements. The sample of silvicultural expenditures tested was found to be accurate for eligible activities. Interim and final invoices were filed appropriately and were authorized by a registered professional forester. Minimum balances ($2,800,100.00) were maintained in the Forest Renewal Trust Fund account on March 31 for 2002 to 2005. The minimum balance in 2006 was $1,983,741.00.

The minimum balance is the amount of funds sufficient to perform renewal on the unit. Buchanan Forest Products Ltd., with permission from OMNR, deferred payment to the trust fund account during the 2005/2006 fiscal year without notice to the SFL holder during the 2005/2006 fiscal year. This is a matter of significant concern for the audit team. If continued, the trust will have insufficient funds to complete the 2007 renewal program by the end of 2007. If renewal cannot be completed, one of the founding principles of sustainable forest management will be compromised. Simply stated, the forest industry will not be renewing the forest it has harvested.

According to verbal information provided by Buchanan Forest Products Ltd., it has committed to pay these funds back with interest upon receipt of monies owing to that company from the softwood lumber dispute. OMNR has confirmed that a repayment schedule has been agreed to and that the deferred funds will be repaid starting in December of 2006, with the final repayments of renewal charges scheduled for December of 2007. Deferred stumpage payments are scheduled to be repaid by March 2008.

While the auditors appreciate the practicality of deferring obligations to pay trust fund fees during a time of financial hardship, the manner in which this was implemented raises issues. The first is that neither the SFL holder nor the OMNR District offices were informed of the deferred payment plan. The Company is directed in the BSF SFL to pay the renewal charges to the trust fund and is liable for the renewal fees on the Forest, yet they were not informed of the payment deferral agreement for some months after payments had stopped. They were subsequently provided with a letter from OMNR allowing them to reduce the silvicultural trust fund balance by the amount owing by Buchanan Forest Products Ltd. They have yet to be informed of the repayment schedule.

The process was less open and transparent than it should have been. At a minimum, the SFL holder and District office need to be informed, in advance, when funding commitments for forest renewal have been altered.

Recommendation 25: The Crown is to make changes regarding overlapping licensees payment to the forest renewal trust only with prior notification to the SFL holder and the OMNR District office.

There is another issue that is raised. The forest renewal trust is the funding measure that ensures that the forest can be regenerated successfully, and effective forest regeneration is a high priority requirement for companies operating on Ontario's Crown forests. Diligence is required by SFL holders to ensure silviculture is completed in a timely and effective manner, and the Crown has several provisions, including trust fund minimum balances, special audits of trust fund expenditures, AWSs, compliance inspections, annual reports, and IFAs, for ensuring this basic work is completed. The audit team notes that the precedent set by this could lead to the trust fund falling below the required minimum and compromise the ability of the SFL holder to meet the obligations to manage the Forest sustainably. In the future, if OMNR chooses to unilaterally grant a deferral of the obligation to pay trust fund charges, that deferral should be for a period not longer than six months, after which the Crown assumes responsibility for the deferred revenues and replenishes the trust fund account with interest.

Recommendation 26: Corporate OMNR is to assume responsibility for any deferred trust fund contributions after a period of not more than six months, after which the Crown assumes responsibility for the deferred revenues and replenishes the trust fund account with interest.

Bowater has satisfied its planning obligations under the terms of its license and the Company's performance in terms of monitoring and reporting has been acceptable. The Company is conducting compliance inspections as proposed in the compliance plans, although report submission is not as timely as it should be. Annual Reports are submitted by the required deadlines. The auditors did note issues with OMNR meeting the Annual Report review deadlines; problems that appear to have been a function of both OMNR workload and the varying quality of submitted reports.

There is a wood supply commitment requiring 289,000 m^3 of hardwood fibre be delivered jointly from the BSF and the neighbouring Dog River Mattawin Forest to Buchanan Northern Hardwoods Inc. There is s similar joint obligation to supply 32,600 veneer quality logs to Columbia (currently Multiply Forest Products Inc.). There is a singular requirement to supply, through a long-term Memorandum of Agreement, round wood fibre to Northern Sawmills Inc. The auditors interviewed representatives from all parties. All of the representatives have indicated they are satisfied with the wood flow coming from the BSF. None of the parties have received the volumes specified, and all rationalize the shortfalls as a function of markets and availability.

An assessment of the Company's performance in meeting its obligations related to compliance monitoring is discussed under Section 3.6 of this report. The Company has met its obligations in this regard.

The Company's performance in meeting its obligations related to observing the provisions of the SGRs is generally covered under Sections 3.3.7, 3.4.3, and 3.4.4 of this report. The audit team's findings confirm that Bowater has met its license obligations with respect to this matter.

The Company's performance in meeting its obligations related to preparing the required FMPs, AWSs, and associated reports is covered elsewhere throughout this report. The Company has met its obligations on this matter in all respects, with the exception of the IFA Action Plan and Action Plan Status Reports, which are discussed above.

The Company's performance in meeting its obligations related to the assessment of harvested areas is generally discussed under Section 3.4.2 of this report. Bowater has met its license obligations in this regard.

The auditors have been unable to verify other contractual obligations related to maintaining records of eligible silviculture work reimbursed by the Forest Renewal Trust Fund. The Draft *Specified Procedures Report* reviewed all charges to the Forest Renewal Trust Fund recorded by Bowater for the period between April 1, 2004 and March 31, 2005. The draft report, received by the audit team after the field audit had been completed, identifies a series of charges that were inconsistent with the terms of the trust fund agreement. For example, 13 invoices, accounting for 5.7 million seedlings, were charged to the wrong fiscal year. Other errors (e.g., differences of 4.9 ha in mechanical site preparation and 2 ha in chemical site preparation) were noted in the draft report. The audit team did not receive a final copy of the *Specified Procedures Report* and is unable to verify the findings. However, as a matter of course, the auditors did view field sites where silviculture activities were completed within the 2004-2005 period identified in the Draft *Specified Procedures Report*. These site inspections routinely included a review of the silvicultural prescription for the site, a field inspection of the silvicultural activities that had taken place (i.e., site preparation, planting, seeding, or tending), and an assessment of the effectiveness of the treatment. Sites were also tracked through the FMP, AWSs, and Annual Reports. Without exception, field sites showed that activities were consistent with trust fund expectations. There is always difficulty in tracing specific treatments back to financial invoices. Many activities, such as aerial spraying or site preparation, are not identified on invoices by specific treatment blocks, but rather by groups of treatments based on area or calendar-based units.

The audit protocol requires an evaluation of company performance in meeting specified silvicultural standards for areas harvested prior to 1994. The Company was not active on these lands during the audit period. The areas designated have had silvicultural work completed previously, have been declared FTG, or have been designated as either new stands or B&S during the most recent FRI.

The Company has met its contractual obligations in an effective manner. The only issue identified by the audit team was deferred trust fund contributions by a third party, which was an event that the Company had no knowledge of or, as it turns out, influence over. The audit team found the Company's operating relationships with the OMNR, LCC,

overlapping licensees, tourist operators, and other stakeholders were positive and progressive.

4.0 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

This audit confirms that this forest is currently being managed in an acceptable manner. This is not to say management of the Forest is perfect. The audit has identified significant administrative and ecological issues, which must be addressed.

The audit has noted a significant concern with the deferral of trust fund payments, and an equally significant concern regarding a failure to meet planned harvest levels on the Forest over the last 15 years. Both of these items have been the subject of explicit recommendations. The auditors have seen no substantial progress to consolidate the fragmented administration of the Forest by OMNR, even though this had been recommended in each of the two previous audits. The recommendation has been repeated. Responsibility for correcting the issue of trust fund deferral and the administration organization of the Forest clearly lies with OMNR. The Company is initially responsible to explain the harvest shortfalls, but the audit team has directed its recommendation to both OMNR and the Company, as both parties will need to be involved in ensuring this wood is either harvested as allocated, or, if found to be surplus, offered to other potential users.

This report contains several other recommendations that, if implemented, will meet the planning or management requirements in a more timely or complete manner.

There are ecological concerns on the Forest. The Forest does not contain sufficient contiguous, mature, conifer forest to meet the levels suggested in the *Forest Management Guide for the Provision of Marten Habitat*. The Company has considered the requirements of the guide in its planning and adjusted its planned activities in order to approach the minimum suggested habitat. The auditors are convinced that the lack of suitable habitat is largely a function of natural depletions and historic harvesting patterns. The only course to meet the minimum targets is to grow more habitat. This forest will not meet suggested targets for marten core areas for some time. The Company has done a credible job of considering the marten requirements in the planning process.

The Forest has more than 30% of its area that is B&S or in the youngest age class. The majority of this is a function of extensive fires in the late 1990's. This newly regenerating forest is and will be a critical part of the BSF for many decades. The audit team is concerned that the renewal of this forest be effectively managed and carefully monitored. Two recommendations and a suggestion have been issued to highlight this. The Company has been asked to re-evaluate its current methodology for stratifying FTG, to ensure that the new forest growing back is properly categorized. The Company has also been asked, through a recommendation, to monitor the recovery of areas burned during the 2001-2006 term, to confirm renewal rates. Finally, it has been suggested that the

Company examine blocks where aerial tending has been unsatisfactory and confirm the reasons for the failure. Re-treatment should be considered immediately.

Other aspects of forest management are completed in a satisfactory manner. Communication between the various stakeholders on the Forest is complicated by the OMNR administrative structure. In spite of that, the auditors found relations are professional and increasingly positive. The licensee is satisfactorily meeting the terms and conditions of the SFL. OMNR is also meeting its overall responsibilities associated with its role in managing this forest. The audit team confirms that, based on the evidence reviewed, management of the Forest was in compliance with the legislation, policy, and regulations that were in effect during 2001-2006 audit term. The BSF is being managed sustainably. Given the effective performance in managing all aspects of the BSF, the audit team has recommended that the term of Sustainable Forest License #542500 be extended for an additional five years.

Recommendation 27: The auditors recommend that the Minister of Natural Resources extend the Sustainable Forest License for the Black Sturgeon Forest for an additional five-year period.

This audit report identifies 27 recommendations and 8 suggestions aimed at improving the management and administration of the BSF. Table 6 summarizes the recommendations and suggestions by each broad audit principle.

Table 6. Recommendations and suggestions arising from the audit.

Principle 1: Commitment
No recommendations or suggestions.
Principle 2: Public Participation
Recommendations: 1) District OMNR shall intensify efforts to recruit new Local Citizens' Committee members with an interest in the Black Sturgeon Forest and, if possible, members from Kiashke Zaaging Anishinaabek. 2) District OMNR shall revise or write a new Local Citizens' Committee Terms of Reference to reflect the 2004 Forest Management Planning Manual requirements. 3) The District Managers of the Thunder Bay and Nipigon Districts shall create a consolidated Local Citizens' Committee focused on activities on the Black Sturgeon Forest. 4) District OMNR shall review tending and renewal planned for the 2006 forest management plan in the Caribou East Parcel against Whitesand First Nation values. 5) Corporate OMNR shall revise Condition #34 Guidelines to ensure that all re-allocations of timber have regard for First Nations economic opportunities.

Principle 3: Forest Management Planning

Recommendations:

6) Corporate OMNR shall assist local efforts to improve caribou habitat use information, including seasonal habitat use and habitat supply in the vicinity of Lake Nipigon, the Islands of Lake Nipigon, and surrounding SFL areas.

7) Corporate OMNR shall correct problems related to values information delivery to planning teams.

8) OMNR shall adequately fund and then collect fish habitat values information. At a minimum, values must be documented prior to the beginning of harvest operations.

9) Corporate OMNR shall ensure that changes to habitat definitions do not affect the ability of planning teams and others to compare the outcomes of habitat management for wildlife indicators.

Suggestions:

1) FMP authors should ensure that the Socio-Economic Impact Model (SEIM) outputs are reasonable and relevant before relying on them as a planning tool.

2) District OMNR should quantify the encroachment of deer into traditional moose and caribou habitat. If populations are established, objectives for deer, moose, and caribou should be coordinated.

Principle 4: Plan Implementation

Recommendations:

10) District OMNR and the Company shall improve spatial modelling systems to ensure forest plans can make progress towards the marten core targets.

11) Bowater and District OMNR shall work cooperatively to ensure that slash burning plans are submitted and approved in a timely fashion.

12) Bowater shall take the necessary steps to ensure that its standard operating practice for mitigating the impacts of chipper pile residue at roadside is more completely implemented.

13) For aerial applications of herbicides, the Company shall apply 120 m buffers only to sensitive areas, as defined by Ministry of the Environment. Where exceptions to this are applied, specific justification should be noted with the prescription.

14) Bowater shall conduct an inventory of older crossings to determine if remedial action is required to address situations where crossings are becoming harmful to the environment (e.g., harmful alteration, disruption, or destruction of fish habitat). Where harm is occurring, the Company shall follow the procedures for unplanned water crossing replacement or water crossing removal, as the case may be, as described in the 2006 forest management plan.

Suggestions:

3) District OMNR could consider reducing the number of biologists with direct input to plan preparation, while retaining their advisory role.

4) Bowater should assess the aerial tending treatment blocks where treatment effectiveness has been unsatisfactory to determine the cause for the results and take appropriate action to correct this matter. Treatment blocks exhibiting ineffective results should be considered for immediate re-treatment.

Principle 5: Systems Support

Suggestion:

5) To help reduce impact to the environment and rehabilitation effort costs, the Company and Regional OMNR should further review the execution of fire line procedures and training requirements, and recognize the need for rehabilitation of fire lines.

Principle 6: Monitoring

Recommendations:

15) Bowater shall ensure that it adheres to commitments and timelines made in its Annual Compliance Schedules of Action, and shall take steps to improve the accuracy of the information included in its compliance activity reports.

16) The Company shall complete Tables RPFO-14 and RPFO-19 for the 1996-2001 Report of Past Forest Operations.

17) Bowater shall re-evaluate the methodology it currently employs for stratifying stands when conducting free-growing assessments.

18) OMNR Nipigon District shall ensure that appropriate staff receive training in the use of the Forest Information Manual Portal.

19) Bowater shall ensure that Table AR-14 is completed in accordance with the Forest Management Planning Manual.

20) The Company shall ensure that progress with regard to any exceptions monitoring program being conducted on the Black Sturgeon Forest be reported annually in the Annual Reports, as required by the 2004 Forest Management Planning Manual.

21) The Company shall ensure that future Annual Reports prepared for the Black Sturgeon Forest comply with the requirements of the Forest Management Planning Manual. Specifically, the text should include a summary of recommendations from action plans prepared in response to independent forest audits conducted during the applicable plan period.

Suggestions:

6) District OMNR should ensure that the number of compliance inspections does not decline below current levels.

7) In preparation for free-growing assessment work using visual methods, Bowater should consider establishing pre-sampled plots that would assist observers in calibrating their ocular assessments.

8) Bowater should ensure that in future reports where the purpose is to evaluate past performance (e.g., Annual Reports under the new FMPM), statements that are intended to stand as recommendations should be clearly highlighted in the report text.

Principle 7: Achievement of Management Objectives and Forest Sustainability

Recommendations:

22) District OMNR and Bowater shall conduct a review of area and volumes harvested on the Black Sturgeon Forest over the past three planning periods, to determine if there is potential to develop markets for timber that is not being utilized.

23) The Company shall monitor recovery of areas burned during the 2001-2006 term, to confirm renewal rates and condition of timber and habitat.

Principle 8: Contractual Obligations

Recommendations:

24) District OMNR is to consolidate administration of the Black Sturgeon Forest so that the SFL holder reports to one OMNR District and one Local Citizens' Committee.

25) The Crown is to make changes regarding overlapping licensees payment to the forest renewal trust only with prior notification to the SFL holder and the OMNR District office.

26) Corporate OMNR is to assume responsibility for any deferred trust fund contributions after a period of not more than six months, after which the Crown assumes responsibility for the deferred revenues and replenishes the trust fund account with interest.

Conclusion

Recommendation:

27) The auditors recommend that the Minister of Natural Resources extend the Sustainable Forest License for the Black Sturgeon Forest for an additional five-year period.

REFERENCES

Callaghan and Associates Inc. 2001. An Independent Audit of Forest Management on the Black Sturgeon Forest for the Period 1996 to 2001. November 2001. 56 pp + appendices.

ES 11/12 Soil Monitoring Procedures Working Group. 2001. Full Tree Harvesting of Ecosites 11 and 12 in Northwestern Ontario: Monitoring Procedures and Best Management Practices. April 1, 2001. 25 pp.

KPMG. 2006a. Specified Procedures Report: DRAFT. Black Sturgeon Forest, Bowater Canadian Forest Products Inc. August 3, 2006. 7 pp.

KPMG. 2006b. Black Sturgeon Forest, Bowater Canadian Forest Products Inc.: Binder of Supporting Documentation to the Specified Procedures Report. June 2006.

OMNR. 1988. Timber Management Guidelines for the Provision of Moose Habitat. Queen's Printer, Toronto, Ont. 33 pp.

OMNR. 1996a. Forest Management Planning Manual for Ontario's Crown Forests. Toronto: Queen's Printer for Ontario. 452 pp.

OMNR 1996b. Forest Management Guidelines for the Provision of Pine Marten Habitat. Queen's Printer for Ontario. 26+ pp.

OMNR. 1997. Criteria for the Removal of Water Crossings of Abandoned Roads. October 1997. 10 pp.

OMNR. 1998. Guideline for Forest Industry Compliance Planning. Ontario Ministry of Natural Resources Forest Policy Series. Toronto: Queen's Printer for Ontario. 13+ pp.

OMNR. 2001a. Forest Management Guide for Natural Disturbance Pattern Emulation, Version 3.1. Toronto: Queen's Printer for Ontario. 40 pp.

OMNR. 2001b. Forest Information Manual. Toronto: Queen's Printer for Ontario. 400 pp.

OMNR. 2003. Old Growth Policy for Ontario's Crown Forests. Forest Policy Series. Version 1. Toronto: Queen's Printer for Ontario. 26 pp.

OMNR. 2004. Forest Management Planning Manual for Ontario's Crown Forests. Toronto: Queen's Printer for Ontario. 440 pp.

OMNR 2005. Guideline for Forest Industry Compliance Planning. Prepared by Forest Operations Compliance Program; Forest Evaluation and Standards Section. January 2005. Queen's Printer for Ontario. 17 pp.

OMNR. 2006. Independent Forest Audit Process and Protocol. February 2006. Toronto: Queen's Printer for Ontario. 26 pp + appendices.

Ontario Ministry of Environment and Energy. 2003. MNR's Class Environmental Assessment Approval for Forest Management on Crown Lands In Ontario. Declaration Order June 25, 2003. 48 pp.

Statutes of Ontario. 1994. The Crown Forest Sustainability Act. Queen's Printer, Toronto, Ont. 32 pp.

Wainman & Kydd. 1996. Audit Report of The Black Sturgeon Forest, SFL #502900, 1991-1996. Wainman & Kydd, Chartered Accountants. 26 pp.

APPENDIX A – COMPARISON AND TREND ANALYSIS OF PLANNED VS. ACTUAL OPERATIONS

Note: Information in this report is appended as submitted by Bowater.

Comparison and Trend Analysis of Planned Versus Actual Forest Operations Report

for the

Black Sturgeon Forest

SFL # 542500

As required by the Independent Forest Audit Protocol 2006

Prepared by:

Jim Miller R. P. F.

Signature:

Date: September13, 2006
Revised: February 15/07

Comparison and Trend Analysis of Planned Versus Actual Forest Operations Report
For the
Black Sturgeon Forest Sustainable Forest License Area

Introduction

The preparation of this report is a requirement of the Independent Forest Audit Protocol for the conduct of the Black Sturgeon Forest audit covering the five year FMP period 2001 – 2006. The comparison and trend analysis report incorporates the FMP that was in place as of March 31st of 2006 as well as the previous TMP 1991 – 1996 and the FMP 1996 - 2001.

The information contained in this report has been derived from the following sources:

1. Timber Management Plan 1991 – 1996
2. Forest Management Plans 1996 – 2001, 2001 – 2006, and 2006 - 2011
3. Report of Past Operations for 1996 – 2001
4. Annual Reports for the period 2001-02 to 2005-06
5. Trend Analysis Report prepared for the IFA in 2001

The final annual report for 2005 – 06 will be submitted to the MNR in March of 2007 for review and approval. The completion of the annual report for 2005-06 has allowed for tables 3 and 4 of this Trend Analysis to be up-dated from the original submission dated September 13, 2006, with complete information for the FMP period 2001-06. The information presented in the tables is now believed to be accurate and complete.

History of Licensing

The Black Sturgeon Forest consists of four separate and distinct blocks. The blocks are located north east of Thunder Bay on Lake Superior and follow Highway 527 northward to Armstrong which is north of the main CNR railway line. These blocks have been managed by the company (now Bowater) as three separate working circles: Caribou east W.C. #2, North and Main Parcels W.C. #7, and the Current River W.C. #8. The size of Working Circle #2 (Caribou Forest) was reduced significantly with the expansion of the Wabakimi wilderness provincial park in the 1990's.

Great Lakes Paper established a newsprint mill in Thunder Bay in 1928. The company obtained harvesting rights to timber from the 4 blocks from the provincial government in various periods. The following summary indicates the approximate year that licenses were issued to the company for the different blocks of the Black Sturgeon Forest:

1. Main Parcel since the 1920's
2. Caribou east portion in 1957
3. Current River in 1970
4. North Parcel in 1973.

The early operations on the Main Parcel were seasonal winter operations that relied on river drives to deliver pulp logs down the Black Sturgeon River to Lake Superior. The logs were then rafted by tug across the lake to the mill in Thunder Bay. The completion of the highway (#527) to Armstrong enabled the development of an all weather road network throughout the Black Sturgeon Forest. The increase in all weather road access and the delivery of wood to the mill by truck eliminated the need for the river drive by the mid 1960's. The development of the main road

network from Highway #527 eastward toward Lake Nipigon throughout the forest was completed by the mid 1980's.

History of Forest Management Planning

The company has prepared harvesting plans to cover operations on the different parcels of the Black Sturgeon Forest since 1952. The initial operations were confined to the Main Parcel but gradually incorporated the other parcels as product demand and mill expansion increased. Records indicate that operating plans were prepared for the following periods; 1952-57, 1962-67, 1970-80, and 1975-95. As harvesting levels increased and operations became year round the Ontario Ministry of Natural Resources assumed responsibility for the silviculture renewal program on crown land in 1960. This was the basic industry and provincial government relationship until the introduction of provincial Forest Management Agreements in 1980.

The FMA for the Black Sturgeon Forest was signed and implemented in 1986. Under this program Bowater became responsible for all forest management activities which included forest management planning, harvest operations, silviculture renewal, cone collection and tree improvement. The Ministry of Natural Resources reviewed and issued approvals for the timber management plan, annual work schedule and monitored the activities on the forest. The Forest Management Agreement still provided funding for the silviculture renewal program from the general revenue funds for the province of Ontario. The FMA remained in effect until 1996 when the "deemed" Sustainable Forest License was signed for the Black Sturgeon Forest. The official SFL for the Black Sturgeon Forest was signed in 2001. The Caribou east portion of the former Working Circle #2 was included at this time as the fourth parcel of the Black Sturgeon Forest. The SFL provided a trust fund account that was dedicated to providing the funds to cover the annual cost of the silviculture program on the Black Sturgeon Forest.

The 1986 Forest Management Agreement for the Black Sturgeon Forest formalized the provincial planning process for a twenty year plan that is subject to audit and renewal every five years. This forest has been subject to two previous Independent Forest Audits (1991-96 and 1996-2001) and one MNR fifth year review (1986-91).

Table 1 – Summary of Total Land Area

The boundaries of the three major blocks of the Black Sturgeon Forest have remained constant for a substantial period of time. Map number 1 in the appendix indicates the boundaries of the F.M.A. that was signed in 1986 by Great Lakes Forest Products Ltd. and the MNR for the Black Sturgeon Forest. This was the area under forest management by the company until 2001 when a new SFL was signed. The new SFL for the Black Sturgeon Forest included the additions of the Caribou east parcel and the McIntyre Peninsula on Lake Nipigon. In 1999 the Ontario Living Legacy project identified several candidate conservation areas and new provincial parks within the Black Sturgeon SFL. The land ownership information (FMP-1) provided by the OMNR for the 2001- 06 FMP classified the O.L.L. proposals as "Crown Unmanaged" lands. The new park and conservation areas received official status at different times during the 2001-06 period but were considered as withdrawals from the managed forest land base.

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Table 1a - Summary of Total Area Under Management
Black Sturgeon Forest
Past and Current Plans - Crown Managed

Land Type		*Area in hectares*		
		Past Plans		Current
		1991 - 1996	1996 - 2001	2001 - 2006
Non-Forested				
Water		47,298.0	47,298.0	36,481.0
Other Land		2,029.0	2,029.0	787.5
Forested				
Non-productive		32,923.0	32,978.0	19,245.1
Productive				
Protection		7,245.1	7,190.0	5,423.2
Production Forest				
	B&S / NSR	81,145.6	52,608.0	41,982.9
	Depleted			84,970.4
	Working Group			
	Pw		274.0	271.2
	Pr			21.2
	Pj	33,035.6	41,771.0	40,488.2
	S	91,489.0	102,006.0	101,063.6
	B	88,369.8	86,561.0	3,364.6
	A			26.7
	Ce			12,100.0
	La			568.3
	OC	10,890.5	11,255.0	
	Po	61,858.3	71,528.0	62,626.5
	Bw	79,292.0	80,078.0	77,874.7
	Ms			
Total Production Forest		446,080.8	446,081.0	425,358.3
Total Forested Land		486,248.9	486,249.0	450,026.6

Source: 1991-96 TMP Table 4.8.2, 1996-2001 FMP Table 4.8.2, 2001-06 FMP Tables FMP-1, FMP-2

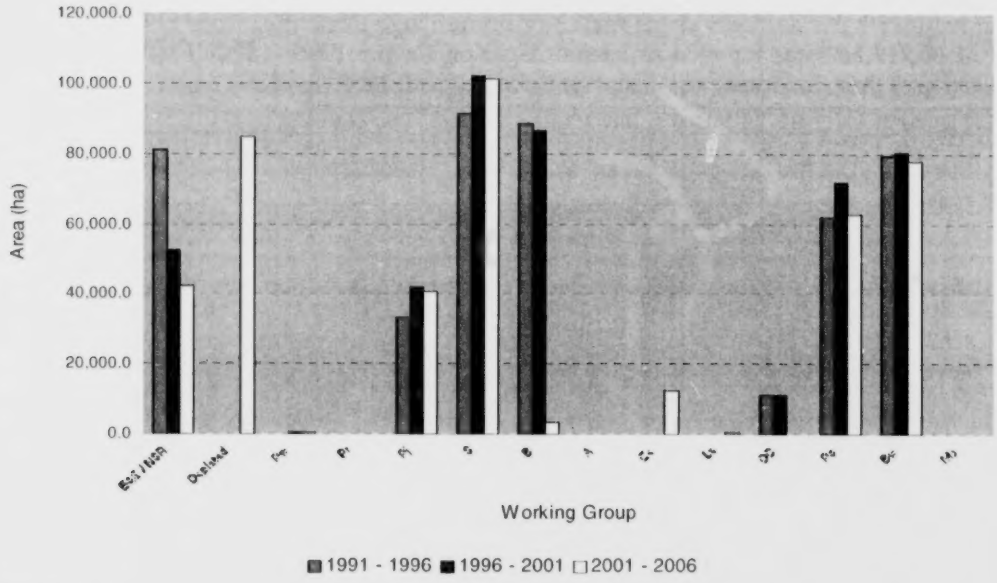

Figure 1a.
Source: 1991-96 TMP Table 4.8.2, 1996-2001 FMP Table 4.8.2, 2001-06 FMP Tables FMP-1, FMP-2

Table 1 does confirm that the Total Production Forest and Forested Land has decreased by 5 and 7% respectively for the 2001-06 plan when compared to the past two plans. The B&S/NSR category has been reduced by 48% from 1991 compared to 2001. However, the amount of area depleted increased in 2001 due to different reporting requirements. Also, a new inventory was used for the 2001 plan and silviculture treatments not yet Free-to-Grow have been identified in the depleted category. The B&S/NSR and depleted categories for the 2001plan represent 30% of the Total Production Forest. This is a significant increase when compared to the 12% B&S for the 1996 plan. However, for the new 2006 FMP the B&S and the depleted categories represent 25% of the Total Production Forest.

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Table 1b - Condition of the Forest as a Percent of the Total Production Forest
Black Sturgeon Forest
Past and Current Plans - Crown Managed

	Area in hectares		
	Past Plans		Current
	1991 - 1996	1996 - 2001	2001 - 2006
Disturbance (Harvest and Natural)	18%	12%	30%
Standing Inventory (Working Group)	82%	88%	70%
Total Production Forest	100%	100%	100%

Source: 2006 IFA, Trend Analysis, Table 1a - Summary of Total Area Under Management

The "standing inventory" within the Working Group summary of Table 1 has decreased over the last fifteen years. The working groups represented a maximum of 88% of the Total

Production Forest for the 1996 FMP but have since decreased to 70% for the 2001 FMP. The major reason for this decline was the impact of several large forest fires from 1996 to 1999. A total of 66,219 ha.[1] was reported as natural depletion for the 1996 – 2001 FMP period. The implication of these fire losses will be further discussed with Table 1c of this report.

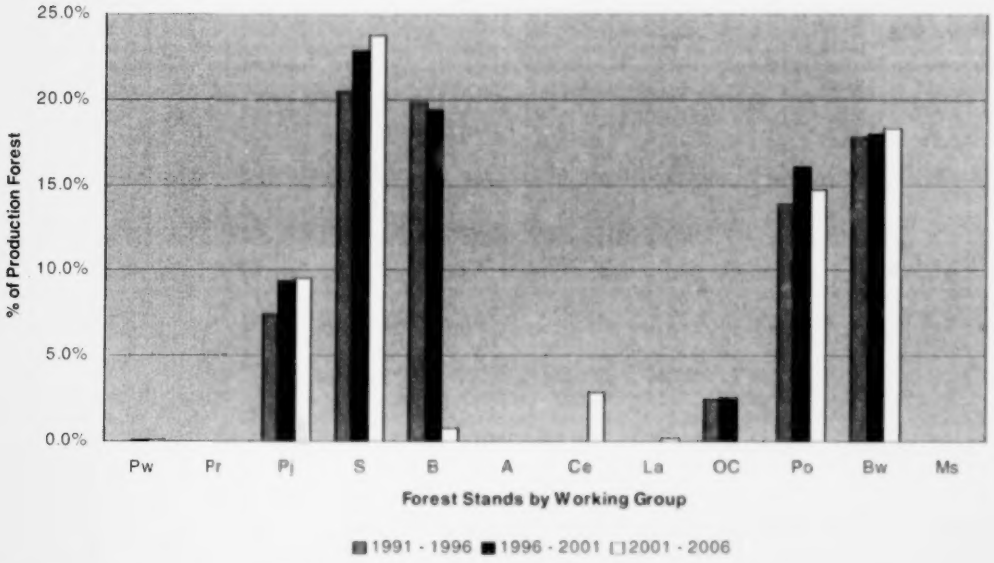

Figure 1b.
Source: 2006 IFA, Trend Analysis, Table 1a - Summary of Total Area Under Management

The working group percentage of the total production forest displays a similar pattern to area for each working group in Figure 1. The working groups appear to be clustered around similar percentages for the 3 planning terms. The collapse of the balsam fir working group on the Black Sturgeon Forest is evident for the 2001 FMP. This was not unexpected with the new inventory from the 1996 photography based on the budworm infestation history of this forest. In 1985 there was a temporary withdrawal of 150.4 km^2 of the Main Parcel license for salvage operations of budworm killed timber.

[1] RPFO 1996-2001

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Table 1c - Total Production Forest by Conifer and Hardwood Working Group Percentages
SFL: Black Sturgeon Forest

	1991 - 1996		1996 - 2001		2001 - 2006	
	Area (ha)	Percent %	Area (ha)	Percent %	Area (ha)	Percent %
Conifer Working Groups (Pw, Pr, Pj, S, B, La, Ce, Oc)	223,785	61	241,867	61	157,877	53
Hardwood Working Groups (Po, Bw, Mh, Oh, A)	141,150	39	151,606	39	140,528	47
Total Production Forest (excluding B&S, NSR, and Depleted - not classified by working group)	364,935		393,473		298,405	

Source: 2006 IFA, Trend Analysis, Table 1a - Summary of Total Area Under Management

The amount of conifer and hardwood area is analyzed in table 1c. The conifer working groups tend to dominant the total production forest. However, there has been a shift between conifer and hardwood area on the Black Sturgeon Forest. The historic pattern for the two past plans has been 61% conifer and 39% hardwood for the standing inventory. The conifer component for the 2001 FMP has been reduced to 53% while the hardwood component has increased to 47%. There are three factors that have contributed to this increase in hardwood on the Black Sturgeon Forest. The fire losses from 1996 to 1999 consumed more conifer hectares than hardwood. The former balsam fir dominated mixedwood stands would have become hardwood stands after the spruce budworm killed the conifer component of the original stand. Also, the areas withdrawn for the new park proposals would have reduced the conifer component of the total production forest available for the 2001 FMP.

The hardwood increases maybe a short term phenomena. The surveys of established plantations and natural disturbances should increase the conifer component as they achieve Free – to – Grow status. In the new 2006 FMP the total production forest in the crown managed category of FMP-1 has increased by 13,357 ha. from the same table in the 2001 FMP. The future audit of the 2006 – 2011 FMP may confirm whether or not there will be a trend toward an increase in the area of hardwood forest units on the Black Sturgeon Forest.

Table 2 – Description of Forest Units

The information contained in TMPM Table 4.11 and 1996 FMPM Table FMP-8 indicates that the forest units have changed from the previous 1976 FRI to the new inventory based on 1996 photography and interpretation. The 1991 TPM had seven working groups which were modified for the 1996 FMP. Several of the working groups were separated into young and old categories to identify the older stands that had been budworm killed. The expectation was that these stands would contain a lower volume than the 1976 inventory predicted. The inventory used for the 2001 FMP is based on ecosite and the forest units changed to give a more accurate description of the forest stands on the landscape. The new regional standard forest units will be used to confirm forest unit continuity over the long term for the Black Sturgeon Forest.

Table 2 - DESCRIPTION OF FOREST UNITS (FMP-8)

April 1, 1991 - March 31, 1996

Forest Unit Code	Forest Unit Name	Forest Type	Main Working Group	Site Type(s)	Silvicultural System	FRI Parameters & Criteria	Additional Information
Sp	Spruce	Conifer	Black Spruce	Boulder Tills, Gravels, Sands Shallow Mineral Soil Organic Soil	Clearcut		
B	Balsam Fir	Conifer	Balsam Fir		Clearcut		
PJ	Jack Pine	Conifer	Jack Pine	Clays, Silts, Loams Boulder Tills, Gravels, Sands Blow Sands (Aeolian Deposits) Shallow Mineral Soil	Clearcut		
Mixed Wood	Mixed Wood	Conifer	Spruce &Pine	Clays, Silts, Loams Boulder Tills, Gravels, Sands Shallow Mineral Soil	Clearcut		
Pr/Pw	Red and White Pine	Conifer	Pine	Clays, Silts, Loams Boulder Tills, Gravels, Sands Shallow Mineral Soil			
Po	Poplar	Intolerant Hardwood	Poplar	Clays, Silts, Loams Boulder Tills, Gravels, Sands Shallow Mineral Soil	Clearcut		
Bw	White Birch	Intolerant Hardwood	White Birch	Clays, Silts, Loams Boulder Tills, Gravels, Sands Shallow Mineral Soil	Clearcut Selection Cut		

Source: Independent Forest Audit for the Period 1996-2001

Table 2 - DESCRIPTION OF FOREST UNITS (FMP-8)

April 1, 1996 - March 31, 2001

Forest Unit		Forest	Main	Site	Silvicultural	FRI Parameters	Additional
Code	Name	Type	Working Group	Type(s)	System	& Criteria	Information
Spl	Lowland Black Spruce	Conifer	Black Spruce	V34,35,36,37	Clearcut		
Suy / Suo	Upland Black Spruce	Conifer	Black Spruce	V19,20,30 31,33 Mixedwood	Clearcut		
Pj	Jack Pine	Conifer	Jack Pine	V17,18,28 29,30,32 Mixedwood	Clearcut		
OC MX	Other Conifer and Mixed Conifer	Conifer		V22,21	Clearcut		
Bf	Balsam Fir	Conifer	Balsam Fir	V14,16	Clearcut		
Bwy Bwo	White Birch	Intolerant Hardwood	White Birch	V4,6,8	Clearcut		
Poy Poo	Poplar	Intolerant Hardwood	Poplar	V10,11,5,6, 7,8,9,10,11	Clearcut		
Pw/Pr	White Pine and Red Pine	Conifer	White Pine Red Pine	V12, 26	Selection		

Source: Independent Forest Audit for the Period 1996-2001

Table 2 - DESCRIPTION OF FOREST UNITS (FMP-8)

April 1, 2001 - March 31, 2006

Forest Unit Code	Forest Unit Name	Forest Type	Main Working Group	Site Type(s)	Silvicultural System	FRI Parameters & Criteria	Additional Information
PRW	Red White Pine	Conifer	White Pine		Clearcut	PR+PW>=4.0	
OC	Other Conifer	Conifer	Cedar		Clearcut	OC+CE+LA>=5.0	
OH	Other Hardwood	Tolerant Hardwood	Ash		Clearcut	AH+MH+BD+EL+YB+MS>=3.0	
SPL	Spruce Lowland	Conifer	Spruce Black		Clearcut	SB>=7 and SB=CE=LA=>=9 or ES=34,35,36 or es=37 and SB>=7	
PJ	Jack Pine all sites	Conifer	Jack Pine		Clearcut	PJ>=6 and PO+BW<2	
SPU	Spruce Upland	Conifer	Spruce Black		Clearcut	PJ>=6 and PO+BW<2	
BF	Balsam Fir	Conifer	Balsam Fir		Clearcut	BF>=6.0	
PO1	Poplar	Intolerant Hardwood	Poplar		Clearcut	PO>=7.0 and SC<=2	
PO3	Poplar	Intolerant Hardwood	Poplar		Clearcut	PO>=7.0 and SC=3,4	
BW	White Birch	Conifer	Balsam Fir		Clearcut	BW>=6.0	
MC1	Mixed Conifer 1	Conifer	Spruce Black		Clearcut	SB+SW+PJ+PR+PW+BF>=7.0 and PO<=2.0	
MC2	Mixed Conifer 2	Conifer	Spruce Black		Clearcut	SB+SW+PJ+PR+PW+BF+CE+LA>=5.0	
MH	Mixed Hardwood	Mixed Wood	Poplar		Clearcut	PO+BW+OH+AH+MS+MH+BD+EL+YB>=5.0	

Source: Independent Forest Audit for the Period 1996-2001

Table 3 – Summary of Planned and Actual Harvest Volumes

The Black Sturgeon Forest has provided wood to the Bowater mill in Thunder Bay for about sixty years. For the term of the audit the forest would have provided about 20% of the wood chips required by the mill on an annual basis. Since the 1991-96 TMP the planned annual volume has increased by about 50% and stabilized for the 1996-2001 and 2001-2006 periods. The actual volume of balsam fir recovered over the three planning periods does confirm the collapse of the species in the new 1996 inventory. The actual annual volumes never come close to achieving the forecasted targets for the three planning periods. The actual annual volumes recovered are illustrating a steady decline when calculated as a percentage of the forecasted volumes.

The 1991-96 TMP was concerned with the salvage of budworm killed stands throughout the Black Sturgeon Forest. The budworm epidemic had progressed eastwards from the Lake Shebandowan area from 1981 to 1993. One of the plans objectives was to maximize the harvest area of budworm killed stands on the forest. A timber surplus was identified in the plan and 64% of the total planned volume was actually harvested on an annual basis. In 1990 an economic recession had a major effect on the pulp and paper industry and hardwood kraft markets were particularly depressed. During the plan term the annual actual conifer volume harvested was 61% of the planned conifer volume and the annual actual hardwood volume was 74% of the annual planned volume. The targets were under achieved partly because harvest operations on the North Parcel were deferred because of First Nation's concerns in the vicinity of Gull Bay.

In 1998 and 1999 major forest fires had a negative effect on the 1996 – 2001 FMP. The fires consumed two years of harvest allocation on the North and Main Parcels of the Black Sturgeon Forest. As a direct result of the fire harvesting contractors were moved from the Black Sturgeon Forest to other Bowater SFL areas until a fire salvage amendment was prepared and approved by the MNR for operations to continue. This explains why only 53% of the planned annual volume was actually harvested for the 1996-2001 period. For the 1996 – 2001 period the actual annual conifer volume harvested increased to 65% of the annual planned volume while the hardwood actual annual volume decreased to only 40% of the annual planned volume.

The annual reports for the years 2001-02 to 2005-06 have been used to annualize the data for the current 2001 – 2006 FMP for comparison purposes with the two past plans. The data indicates the annualized total actual volume continues to be less than the total planned volume at 46%. In 2003 a major contractor terminated harvesting operations on the Main Parcel of the Black Sturgeon Forest. Since this operation was not replaced the actual volume harvested for the five year period should be well short of the planned volume for a third consecutive term. To date the conifer annualized actual volume is 56% of the planned conifer volume and the hardwood annualized actual volume is 37% of the planned hardwood volume.

In the 2001 plan large areas of fire salvage were allocated as potential harvest and the volume was included as planned harvest. It was known during the plan preparation that only a portion of the potential salvage area would be feasible for harvest and only a portion of the planned volume would be realized. The volumes forecasted were not reduced in the plan even though it was known that Bowater could not operate all the salvage allocations. The shortfall was expected because it was anticipated that the quality of the salvage allocation would deteriorate over time.

The same argument was used for the budworm salvage areas in the 1991 and 1996 plans. Large salvage allocations were identified for the plans knowing full well that the volume to be

recovered would be below the planned volume levels. The 1991-96 TMP even identified a surplus volume on Table 4.18.1 for the Forecast of Wood Utilization by Licensee of 2,554,660 m^3.

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Table 3 - Summary of Planned & Actual Harvest Volumes
Black Sturgeon Forest
Average Planned and Actual Annual Harvest Volumes

Average Planned Annual Harvest Volumes

Species	Volumes are Annualized		
	Past Plans		Current
	1991 - 1996	1996 - 2001	2001 - 2006
Spruce	199,400	232,000	214,802
Balsam Fir	138,000	81,600	51,410
Jack Pine	43,400	84,400	96,187
Cedar	9,000	0	2,104
Larch	800	600	11,031
Red Pine			441
White Pine			525
White Pine / Red Pine	2,000	0	
Poplar	114,200	235,800	235,859
Birch	9,000	131,200	176,621
Other Hardwoods			
Total Planned Volumes	515,800	765,600	788,980

Average Actual Annual Harvest Volumes

Species	Volumes are Annualized		
	Past Plans		Current
	1991 - 1996	1996 - 2001	2001 - 2006
Spruce	101,670.0	128,444.0	137,181.2
Balsam Fir	89,185.0	49,049.0	24,873.8
Jack Pine	48,484.0	81,570.0	46,470.6
Cedar	223.0	273.0	2,113.2
Larch	0.0	116.0	190.6
Red Pine			
White Pine			
White Pine / Red Pine	113.0	41.0	11.0
Poplar	87,409.0	102,107.0	110,754.6
Birch	3,966.0	5,589.0	41,906.8
Other Hardwoods		38,930.0	
Total Actual Volumes	331,050.0	406,119.0	363,501.8

Source: planned: TMPM Table 4.18.1, FMPM RPFO-4, FMPM FMP-21
actual: FMPM RPFO-4, RPFO-4a, Annual Reports 2001-05

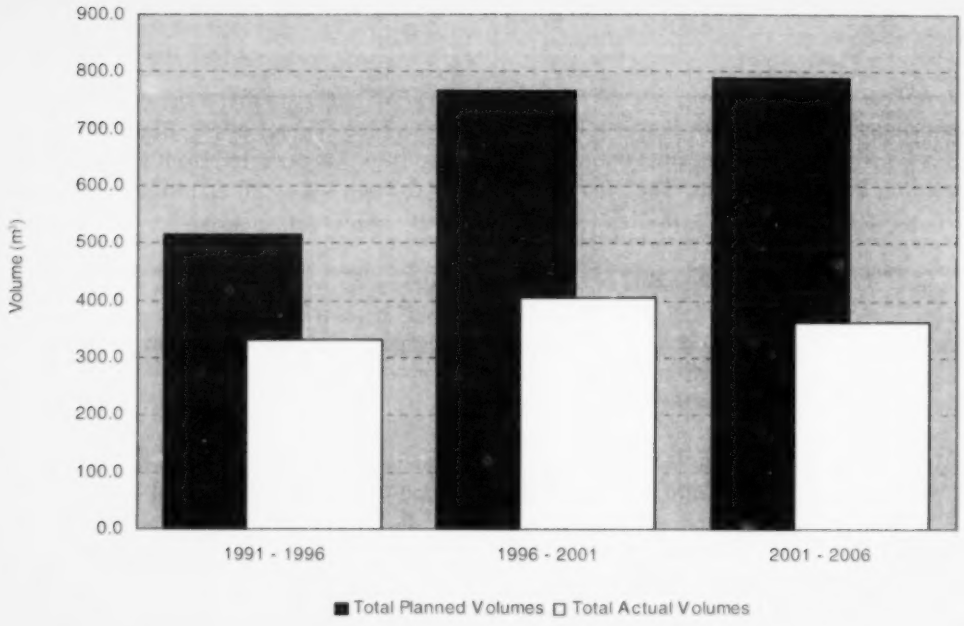

Figure 2. Total planned and actual harvest volumes
Source: planned: TMPM Table 4.18.1, FMPM RPFO-4, FMPM FMP-21
actual: FMPM RPFO-4, RPFO-4a, Annual Reports 2001-05

Table 4 – Summary of Planned and Actual Depletion Area

This table indicates that the area available or identified for harvesting operations has continued to decrease over the three planning periods. The complexity of MNR guidelines continued to evolve over the fifteen year period and put pressure on areas available for harvesting timber. The Lands for Life process identified some new parks in the Black Sturgeon Forest that provide recreation opportunities for people from Thunder Bay and Nipigon. The new ownership data provided by the MNR for the 2001-2006 FMP indicated a 7% decrease in the total forested land compared to the two previous plans.

The 1991-96 TMP proposed to deal with the large area of the spruce budworm infestation. The poor quality of the stands and the economic recession had an impact on the annual actual harvest area. The harvest depletion accounts for 38% of the annual planned area for the plan term. The deferral of operations on the North Parcel also had a negative impact on achieving the planned harvest area for the forest.

The 1996 – 2001 FMP would have completed the salvage of the budworm killed stands on the Black Sturgeon Forest. However, the large fires during the plan term eliminated any chance of maximizing the planned area on the forest. The harvesting operations did achieve 57% of the annual planned area before being transferred to other SFL's.

The final annual report for the 2001 – 2006 FMP period indicates that 56% of the planned harvest area has been depleted. One harvest contractor ceased operations on the forest midway

through the plan and was not replaced. The quality of the stands for the fire salvage deteriorated because of windthrow which made harvesting operations uneconomical for the latter portion of the plan.

A review of the depletions to date for the 2001-06 FMP indicate that most of the bypass area is associated with the North Parcel (Gull Bay) and the Main Parcel of the Black Sturgeon Forest. This is to be expected since the majority of the large fires that occurred from 1996 to 1999 were located on these two blocks. The plan allocations have been bypassed due to the following factors:

1. terrain is inoperable or there is no access
2. birch content of the stand is high and the distance from the mill
3. salvage stands have deteriorated to the point that it is no longer economical to harvest (generally now blowdown)
4. unmerchantable because of small size

At the time of plan production Bowater was aware that only a portion of the salvage area allocated would be harvested. There was no effective method to stratify the potential salvage area into possible harvest and probable by pass so it was all allocated. Also, it was not possible to predict what area would become inoperable due to windthrow over the plan period.

The planned area available for harvest during the 2001-06 FMP declined by 28% compared to the previous 1991-96 FMP term. The actual harvest area depleted for the same two FMP's appears to have stabilized at about 60% of the planned depletions. The future harvest area may depend on economics and quality of wood when compared to other SFL's with the emphasis on softwood since the hardwood markets have declined for the past three years. The recently announced merger of Bowater and Abitibi may have a significant impact on the Black Sturgeon Forest given the economic climate to reduce product and wood costs in the global market place.

2006 Independent Forest Audit
Table 4 - Summary of Planned & Actual Depletion Area
Black Sturgeon Forest
Past and Current Plans

Plan Term	Planned Annual Harvest Area			Actual Depletion Area		
	Area in hectares (Area is Annualized			Area in hectares (Area is Annualized)		
	Past Plans		Current	Past Plans		Current
	1991 - 1996	1996 - 2001	2001 - 2006	1991 - 1996	1996 - 2001	2001 - 2006
Forest Unit	Planned	Planned	Planned	Harvest	Harvest	Harvest
Balsam Fir	3,782.0	1,918.0	13.0	1,432.0	1,012.0	6.4
Jack Pine	649.0	552.0	292.0	345.0	493.0	206.7
Jack Pine 2						
Jack Pine 3						
Spruce 1						
Spruce 3						
Birch	2,322.0	1,759.0	908.0	704.0	803.0	244.1
Poplar	1,480.0	1,402.0	20.0	511.0	763.0	60.4
Poplar 2						
Poplar 3			95.0			72.5
Mixed Conifer 1		20.0	332.0		12.0	325.4
Mixed Conifer 2			2,019.0			1,097.6
Mixed Hardwood 1			1,012.0			704.3
Other Conifer	136.0	26.0	228.0	19.0	5.0	3.0
Spruce Lowland		576.0	72.0		369.0	54.8
Spruce Upland	1,142.0	709.0	208.0	585.0	705.0	121.5
Red Pine	0.0	0.0			0.0	
White Pine	0.0	0.0			0.0	
PJO		79.0			8.0	
PJP						
SPO		230.0				
SPP						
PWR			10.0			0.0
OH			0.0			0.0
Total Area:	9,511.0	7,271.0	5,209.0	3,596.0	4,170.0	2,896.7

Source: planned: TMPM Table 4.15, FMPM Table 4.15, FMPM Table FMP-18a
actual: FMPM RPFO-1, Annual Reports 2001-05 AR-1

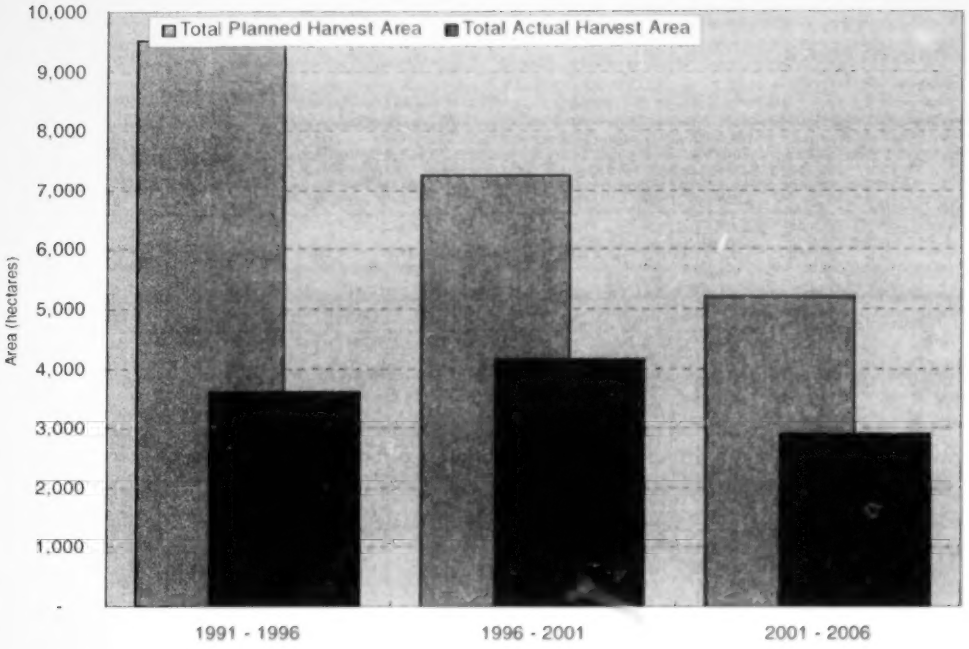

Figure 3. Total planned and actual harvest area
Source: planned: TMPM Table 4.15, FMPM Table 4.15, FMPM FMP-18a
actual: FMPM RPFO-1, Annual Reports 2001-05 AR-1

Table 5 – Summary of Managed Productive Forest by Forest Unit

An analysis of the forest condition of the Black Sturgeon Forest will be difficult to comment on for several reasons. Two entirely different inventories were used for planning purposes over the fifteen year period. The original 1976 inventory was modified for the 1996 FMP to reflect the conditions of young and old stands within the same working group. The 2001 FMP used a new inventory (1996) that is ecosite based as well as a different mapping projection with new ownership boundaries for the forest

Any future changes in forest composition will be the result of recent natural disturbances. The fire areas that were not salvaged will need to be monitored to determine if there is any future change in forest units when they are identified as FTG and put back into the FRI inventory.

The direct comparison of managed productive forest by forest unit areas over time is difficult based on the reasons noted above. However, some general trends are identifiable. The first trend is the reduction in conifer dominated forest and a corresponding increase in mixed hardwood or conifer-hardwood stands. The 1996 FMP used the FRI from 1976, where the 2001 FMP used the new inventory interpreted in 1997. The 1976 inventory is characterized by many stands that are over-mature and approaching climax condition. The primary agent of change in that period was the spruce budworm outbreak that almost completely removed the balsam fir component of the forest and significantly reduced the white spruce and to a lesser extent the black spruce.

Between 1996 and 2001 the principal agents of change were the large forest fires that burned across the unit in 1996, 1998, and 1999. Estimates of forest composition were used for the 2001 FMP, in 2006 there was more actual information available for the depletions, in particular stands that were salvaged and/or renewed artificially.

The cumulative results of these forces of change were to reduce the overall conifer composition in the inventory. The budworm outbreak created mixedwood stands generally MC2 or MH1. The fires, especially those that burned over budworm infested areas, are trending toward more hardwood dominated stands, especially PO1 forest unit. The results of all these natural dynamics will be clearer when the forest is re-inventoried before 2016.

Table 5 - SUMMARY OF MANAGED PRODUCTIVE FOREST BY FOREST UNIT (FMP-9)
April 1, 1991 - March 31, 1996

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
Sp	BS/NSR						38268.4	
	FTG - 20						505	
	21 - 40						23511.7	
	41 - 60						16224	
	61 - 80						14958.2	
	81 - 100						9387.5	
	101 - 120						9423.5	
	121+						17479.1	
Forest Unit Subtotal		3,501					129757.4	
Bf	BS/NSR						14413.5	
	FTG - 20							
	21 - 40						13169.5	
	41 - 60						56786.3	
	61 - 80						13510.2	
	81 - 100						2469.8	
	101 - 120						1921.4	
	121+						512.5	
Forest Unit Subtotal		110					102783.2	
Pj	BS/NSR						14099.5	
	FTG - 20						539	
	21 - 40						7812.7	
	41 - 60						14129.4	
	61 - 80						7763.7	
	81 - 100						778.5	
	101 - 120						596.7	
	121+						1415.5	
Forest Unit Subtotal		313					47135	

Source: Independent Forest Audit for the Period 1996-2001

Forest Unit	Age Class	Protection Forest (ha)	Protection Forest (m^3)	Production Forest Unavailable (ha)	Production Forest Unavailable (m^3)	Stage of Management	Production Forest Available (ha)	Production Forest Available (m^3)
Po	BS/NSR						8169.1	
	FTG - 20						5683.1	
	21 - 40						2853.9	
	41 - 60						19282.1	
	61 - 80						15985.4	
	81 - 100						2900.7	
	101 - 120						3996.6	
	121+						11156.5	
Forest Unit Subtotal		2,137					70027.4	
Bw	BS/NSR						6187.6	
	FTG - 20						710.9	
	21 - 40						3892.2	
	41 - 60						24469.1	
	61 - 80						13897.2	
	81 - 100						9701.7	
	101 - 120						14035.1	
	121+						12585.9	
Forest Unit Subtotal		858.6					85479.7	
OC	BS/NSR						7.5	
	FTG - 20							
	21 - 40						65.7	
	41 - 60						546.2	
	61 - 80						799.4	
	81 - 100						1053.2	
	101 - 120						3045.7	
	121+						5380.3	
Forest Unit Subtotal		325.6					10898	
	Total	7,245					446,081	

Source: Independent Forest Audit for the Period 1996-2001

Table 5 - SUMMARY OF MANAGED PRODUCTIVE FOREST BY FOREST UNIT (FMP-9)
April 1, 1996 - March 31, 2001

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
Sp	BS/NSR						27251	
	FTG - 20						9045	
	21 - 40						20976	
	41 - 60						19279	
	61 - 80						15678	
	81 - 100						10441	
	101 - 120						8883	
	121+						17704	
Forest Unit Subtotal		3473					129257	
B	BS/NSR						947	
	FTG - 20						731	
	21 - 40						4068	
	41 - 60						60637	
	61 - 80						15321	
	81 - 100						3032	
	101 - 120						1654	
	121+						1118	
Forest Unit Subtotal		110					87508	
PJ	BS/NSR						5050	
	FTG - 20						10378	
	21 - 40						5077	
	41 - 60						15400	
	61 - 80						8399	
	81 - 100						502	
	101 - 120						445	
	121+						1570	
Forest Unit Subtotal		313					46821	

Source: Independent Forest Audit for the Period 1996-2001

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
Po	BS/NSR						14730	
	FTG - 20						11010	
	21 - 40						5929	
	41 - 60						18700	
	61 - 80						17931	
	81 - 100						3159	
	101 - 120						2592	
	121+						12207	
Forest Unit Subtotal		2117					86258	
Bw	BS/NSR						2842	
	FTG - 20						953	
	21 - 40						1087	
	41 - 60						26418	
	61 - 80						14391	
	81 - 100						7290	
	101 - 120						15344	
	121+						14595	
Forest Unit Subtotal		851					82920	
OC / MC	BS/NSR						1788	
	FTG - 20						349	
	21 - 40						412	
	41 - 60						1099	
	61 - 80						1559	
	81 - 100						935	
	101 - 120						2156	
	121+						4745	
Forest Unit Subtotal		326					13043	
Pw / Pr	BS/NSR							
	FTG - 20							
	21 - 40						34	
	41 - 60							
	61 - 80							
	81 - 100							
	101 - 120							
	121+						240	
Forest Unit Subtotal		0					274	
Total		7190					446081	

Source: Independent Forest Audit for the Period 1996-2001

Table 5 - SUMMARY OF MANAGED PRODUCTIVE FOREST BY FOREST UNIT (FMP-9)

April 1, 2001 - March 31, 2006

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
PRW	1 to 20						65.2	
	61 - 80					FR	35.1	5124.6
	81 - 100					FR	141	27088
	101 - 120					FR	3	602.4
	161 - 180					FR	92.4	15523.2
Forest Unit Subtotal							336.7	48338.2
OC	B&S						412.9	
	1 to 20						2641.4	
	21 - 40						18.2	127.4
	41 - 60	14.4	374.4				1118.5	25396
	61 - 80	49.8	2123				3629.4	175517.4
	81 - 100	139.2	10074.6				4431.7	350894.2
	101 - 120	64.4	6602.4				2533	264541.4
	121 - 140	75	7881.6				880.8	92421
	141 - 160	40.1	3231.5				271.4	21388.2
	161 - 180						8.3	508.8
	181 - 200	13.2	567.6				26.6	1143.8
	201 - 220	15.2	653.6				9.8	421.4
Forest Unit Subtotal		411.3	31508.7				15982	932359.6
OH	B&S						0.2	
	1 to 20						9.7	
	61 - 80	3.1	201.5					
	81 - 100						26.7	1975.8
Forest Unit Subtotal		3.1	201.5				36.6	1975.8

Source: Independent Forest Audit for the Period 1996-2001

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
SPL	B&S						1042.6	
	1 to 20						5955.2	
	21 - 40						546.4	987.3
	41 - 60	35.8	716				4703.8	72507.2
	61 - 80	342	14577.2				9828.5	404646.1
	81 - 100	489.7	32433.6				5616.2	396402.6
	101 - 120	261.8	24719.2				3946.7	383922.3
	121 - 140	446.4	50001.2				1152.2	129395.4
	141 - 160						109	11219
	161 - 180						10.8	883.2
Forest Unit Subtotal		1575.7	122447.2	0	0		32911.4	1399963.1
PJ	B&S						305.1	
	1 to 20						17310.2	14676
	21 - 40	16.4	885.6				4296	108157.5
	41 - 60						4601.9	472046
	61 - 80	19.9	3408				5495	961788.8
	81 - 100	169.1	34327.3				1053.7	213828.1
	101 - 120						116.7	20509.5
	121 - 140	17.9	1843.7				59	6792
Forest Unit Subtotal		223.3	40464.6	0	0		33237.6	1797797.9
SPU	B&S						1271.8	
	1 to 20						35912.9	
	21 - 40	3.6	82.8				1865.2	23344.1
	41 - 60						3619.5	232439.4
	61 - 80	28.1	3111.9				8875.8	1011459.3
	81 - 100	120	18654.6				6541.9	1010548
	101 - 120	5.1	912.9				2499.8	442345
	121 - 140						767	112841.7
	141 - 160	7.4	821.4				130.4	15410.5
	161 - 180						10.1	909
Forest Unit Subtotal		164.2	23583.6	0	0		61494.4	2849297

Source: Independent Forest Audit for the Period 1996-2001

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
BF	B&F						26.1	
	1 to 20						328.4	86.4
	21 - 40						26.2	2245.3
	41 - 60						113.3	16293.2
	61 - 80						212	32655.5
	81 - 100						26.8	2814
	101 - 120						13.3	891.1
	121 - 140						0	
	141 - 160						0.6	61.8
Forest Unit Subtotal		0	0	0	0		746.7	55047.3
PO1	B&S						582.2	
	1 to 20						7466.7	18441
	21 - 40						1858.8	201500.4
	41 - 60						4068.1	955729.1
	61 - 80						3446.8	943932.8
	81 - 100						371.6	103676.4
	101 - 120						70.7	18240.6
Forest Unit Subtotal		0	0	0	0		17864.9	2241520.3
PO3	B&S						49.5	
	1 to 20						1048.9	6117.6
	21 - 40						218.8	9846
	41 - 60	13.6	2080.8				429	64876.5
	61 - 80	51.4	8653.2				1186.1	200391.8
	81 - 100	25.6	4096				180.6	28221
	101 - 120						0.3	38.4
Forest Unit Subtotal		90.6	14830	0	0		3113.2	309491.3
BW	B&S						1646.8	
	1 to 20	7					10120.2	1132
	21 - 40	80.9	4287.7				2586.8	113563.6
	41 - 60	349.5	34811.5				10729.2	1105864.6
	61 - 80	260.1	39435.2				11917.9	1833747.5
	81 - 100	51.6	7603.2				2300.6	335341.6
	101 - 120						614.4	60200
	121 - 140						205.2	11436.3
	141 - 160						10.9	611.6
Forest Unit Subtotal		749.1	86137.6	0	0		40132	3461897.2

Source: Independent Forest Audit for the Period 1996-2001

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
MC1	B&S						731.4	
	1 to 20	40.3	2095.6				6499.7	
	21 - 40						2317.6	70042.4
	41 - 60	5.5	1039.5				5925.9	687005.4
	61 - 80	35.4	6973.8				8462.9	1503244.1
	81 - 100	20.9	3594.8				3074.4	603210.9
	101 - 120						653.6	106120.1
	121 - 140						424.1	45859.5
	141 - 160						29.5	1770
Forest Unit Subtotal		102.1	13703.7	0	0		28119.1	3017252.4
MC2	B&S						4594.8	
	1 to 20						25057.6	91754.1
	21 - 40	84.7	4997.3				9355.1	655202.5
	41 - 60	172.7	23717.7				20409.9	2773964.3
	61 - 80	276.4	44284.6				33314.9	5334283.7
	81 - 100	186.6	25682.5				17229.9	2366530.3
	101 - 120	111.5	10830.1				4540	474365.8
	121 - 140	28.1	2332.3				1931.9	161271.1
	141 - 160	32.8	2952				214.5	20540.2
	161 - 180	9.7	1047.6					
Forest Unit Subtotal		902.5	115844.1	0	0		116648.6	11877912
MH	B&S						3328.1	
	1 to 20						19078.8	19534.2
	21 - 40	25.3	632.5				8790.9	328092.5
	41 - 60	208	21169.5				25278.1	2649180.5
	61 - 80	724.9	114496.4				26291.5	4144106.6
	81 - 100	18.6	2295				4435.7	653087.3
	101 - 120	21.7	2039.8				967.1	90489.4
	121 - 140						207.6	15570
	141 - 160						103.9	8312
Forest Unit Subtotal		998.5	140633.2	0	0		88481.7	7908372.5
	Total	5220.4	589354.2	0	0		439104.9	35901224.6

Source: Independent Forest Audit for the Period 1996-2001

Table 6 – Summary Report of Renewal, Tending and Protection Operations

The amount of renewal under taken on the forest is directly related to the depletions that are achieved over any given period. The FMP-25 renewal targets are difficult to predict because they are based on an estimate for the depletions for a previous plan plus a current plan. Generally areas that are harvested in the latter part of a previous plan will be artificially renewed by year 2 or 3 of a new plan. A comparison of the actual artificial and natural treatments over the 3 planning terms may indicate suitable trends.

2006 Independent Forest Audit
Table 6a - Summary Report of Renewal, Tending, and Protection Operations
Black Sturgeon Forest
Past and Current Plans

	Area Summary of all Forest Units (ha)					
	Past Plan Term		Past Plan Term		Current Plan Term	
	Planned	Actual	Planned	Actual	Planned	Actual
Renewal	1991 - 1996	1991 - 1996	1996 - 2001	1996 - 2001	2001 - 2006	2001 - 2006
Regeneration						
Uneven-Aged Management						
Selection Cut - Harvest						
Total Uneven-Aged Management	0.0	0.0	0.0	0.0	0.0	0.0
Even-Aged Management						
Natural Regeneration						
Uniform Shelterwood Seed Cut	0.0	0.0	400.0	0.0	0.0	0.0
Clear-cut	8,581.0	1,197.0	11,450.0	5,033.0	10,855.0	5,228.8
Strip Cut	0.0	0.0	0.0	126.0	0.0	
CLAAG (natural seeding)	0.0	0.0	0.0	0.0	1,677.0	1,123.5
Group seed tree cut	1,870.0	0.0	2,565.0	1,095.0	173.0	759.1
Clear-cut Natural Seeding	0.0	0.0	4,300.0	0.0	0.0	1,360.3
Subtotal Natural	10,451.0	1,197.0	18,715.0	6,254.0	12,705.0	8,471.7
Artificial Regeneration						
Planting	16,974.0	13,287.0	18,392.0	14,940.0	11,208.0	15,082.9
Seeding Direct	12,886.0	2,381.0	4,450.0	2,333.0	3,639.0	2,032.0
Shelter Cones						
with Site Preparation	0.0	318.0	2,225.0	663.0	654.0	0.0
Scarification (with natural seeding)	0.0	0.0	1,925.0	0.0	0.0	0.0
Subtotal Artificial	29,860.0	15,986.0	26,992.0	17,936.0	15,501.0	17,114.9
Total Even-Aged Management	40,311.0	17,183.0	45,707.0	24,190.0	28,206.0	25,586.6
Total Regeneration	40,311.0	17,183.0	45,707.0	24,190.0	28,206.0	25,586.6
Site Preparation						
Mechanical	25,623.0	7,322.0	9,000.0	8,060.0	12,825.0	14,259.8
Chemical	0.0	3,330.0	10,600.0	2,162.0	3,077.0	1,266.4
Prescribed Burn	300.0	0.0	1,700.0	0.0	0.0	0.0
Slash Pile Burning	0.0	0.0	0.0	517.0	0.0	70.3
Total Site Preparation	25,923.0	10,652.0	21,300.0	10,739.0	15,902.0	15,596.5
Tending						
Cleaning						
manual	0.0	3.0	1,400.0	121.0	0.0	0.0
chemical - ground	16,425.0	1,063.0	5,600.0	2,524.0	2,818.0	2,553.7
- aerial	2,540.0	9,830.0	1,750.0	13,330.0	12,633.0	9,910.7
mechanical	0.0	0.0	1,750.0	0.0	0.0	0.0
prescribed burn	0.0	0.0	0.0	0.0	0.0	0.0
Spacing, pre-commercial thinning, improvement cutting						
even-aged	0.0	8.0	5,941.0	610.0	2,150.0	2,689.6
uneven-aged	0.0	0.0	0.0	0.0	0.0	0.0
Cultivation	0.0	0.0	0.0	0.0	0.0	0.0
Total Tending	18,965.0	10,904.0	16,441.0	16,585.0	17,601.0	15,154.0

Source: planned: TMPM Table 4.19, FMPM Table 4.19.1, FMPM Table FMP-25
actual: FMPM Table RPFO-7, Annual Reports 2001-04, Bowater SRS actuals for 2005

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Table 6b - Comparison of Extensive and Intensive Silviculture
Black Sturgeon Forest

Renewal Class	Area Summary of all Forest Units (ha)					
	Past Plan Term		Past Plan Term		Current Plan Term	
	Planned 1991 - 96	Actual 1991 - 96	Planned 1996 - 01	Actual 1996 - 01	Planned 2001 - 06	Actual 2001 - 06
Natural	25.9	6.9	40.2	25.8	45	33.1
Artificial	74.1	93.1	59.8	74.2	55	66.9
Total	100	100	100	100	100	100

Source:Table 6 - Summary Report of Renewal, Tending, and Protection Operations (RPFO-7)

A review of Tables 6a and 6b indicate some significant trends with the silviculture renewal program on the Black Sturgeon Forest. There has been a greater emphasis placed on the reliance of natural regeneration over the fifteen year period. The actual area for natural regeneration has never achieved the planned targets since they were not recorded on the Silviculture Record Keeping System (SRS) on a regular annual basis for the past plans. The "cuts not treated" were identified during the 1996 – 2001 plan. They were surveyed over that period and the naturals were recorded on the SRS system which accounts for the increase from 6.9% in the 1991-96 plan to 25.8% in the 1996-01 period. A post harvest prescription survey program was formalized during the 2001-06 plan. Natural areas are now identified and mapped on the ground as part of the post harvest forest operations prescription. These natural areas are then recorded as silviculture treatments on an annual basis for the MNR annual report.

The planned artificial regeneration treatments illustrate a decrease over the three planning periods because of the increased reliance on natural regeneration. The conversion of balsam fir salvage stands to spruce plantations accounts for the high level of artificial treatments in the 1991-96 TMP. The anticipated increase in hardwood pulp for the 1996-01 and 2001-06 FMP would account for the planned decrease in artificial treatments. The artificial treatments in the 1996-01 period exceeded the planned targets since a number of plantations that burnt were retreated under the Forestry Futures Fund program. For the three planning terms the actual artificial regeneration treatments accomplished 70.5% of the collective planned total.

The artificial treatments have continued to exceed their planned targets over the three planning terms. The Black Sturgeon Forest has productive sites with fine textured soils that are extremely competitive once the site has been disturbed. The budworm killed sites have been planted to improve the future forest stands. On the Current River block hardwood stands have been converted to conifer because of their close proximity to the Thunder Bay mill. The Forestry Futures Fund has provided additional dollars to retreat sites that have been burned or enhance portions of mixed wood sites with conifer where the poplar coppice growth did not adequately regenerate.

The site preparation only achieved 58.5% collectively of the total planned area for the three terms. The proposed harvest for the 19991-96 plan was optimistic in view of the extent of the budworm damage. The timber losses from the fires in 1998 and 1999 forced harvesting operations onto other SFL thereby reducing the need for site preparation in the 1996-01 plan. The site preparation target for the current plan was achieved.

Juvenile spacing operations were started on the Black Sturgeon Forest during the 1996-01 FMP. The company union employees commuted to areas on the Current River block and a small First Nation contractor worked from Gull Bay on the North Parcel. The proposed target of approximately 1200 ha. a year was not achieved because that amount of jack pine area was not available for spacing. A more suitable target of 430 ha. per year was established for the 2001-06 plan. First Nation contractors from Gull Bay and Rocky Bay were employed to complete these projects. The Current River block is close to Thunder Bay and has been managed intensively with density control programs.

Table 7 – Harvested Area Successfully Regenerated – Summary of all forest units

Table 7 is an analysis of the harvest depletions for the Black Sturgeon Forest for the 1991-95 period. At that time the Caribou East parcel was administered by the MNR as a Crown Unit whereby the MNR coordinated the renewal activities. In 2001 the Caribou East became part of Bowater's new SFL for the Black Sturgeon Forest. The history of the Caribou East for the period 1991-95 is now a permanent component of Bowater's silviculture record system. This amalgamation accounts for the total area harvested from 1991-95 in Table 7 exceeding the actual depletion area in the Table 4 summary of planned and actual depletion areas for the past 1991-96 plan.

The information for table 7 was taken from queries with the Bowater GIS data base. The harvest depletions for the 1991 – 1995 period has been compared to the Free to Grow data base as of December 2005. A further analysis of the area not declared free to grow is provided in table 7b. Approximately 18% of the harvest depletions from the 1991-96 period are classified as not Free to Grow (refer to figure 5).

2006 Independent Forest Audit
Table 7 - Harvested Area Successfully Regenerated - Summary of All Forest Units
Black Sturgeon Forest

	AREA IN HECTARES (All Forest Units Combined) Even-aged Management
Total Area Harvested 1991 - 1995	22,648.0
Total Area Surveyed for Regeneration Success	22,648.0
Total Unsurveyed Area	
Total Area Declared Successfully Regenerated	18,617.0
Total Area Surveyed Not Successfully Regenerated (NSR)	
B&S	2,787.0
Not Available for Regeneration (eg. Roads & landings)	594.0
Other	650
Percent of Area Surveyed Declared Successfully Regenerated	82.0

Source: Computed from GIS records and queries of depletions from 1991-1995 and the results of free-to-grow surveys.

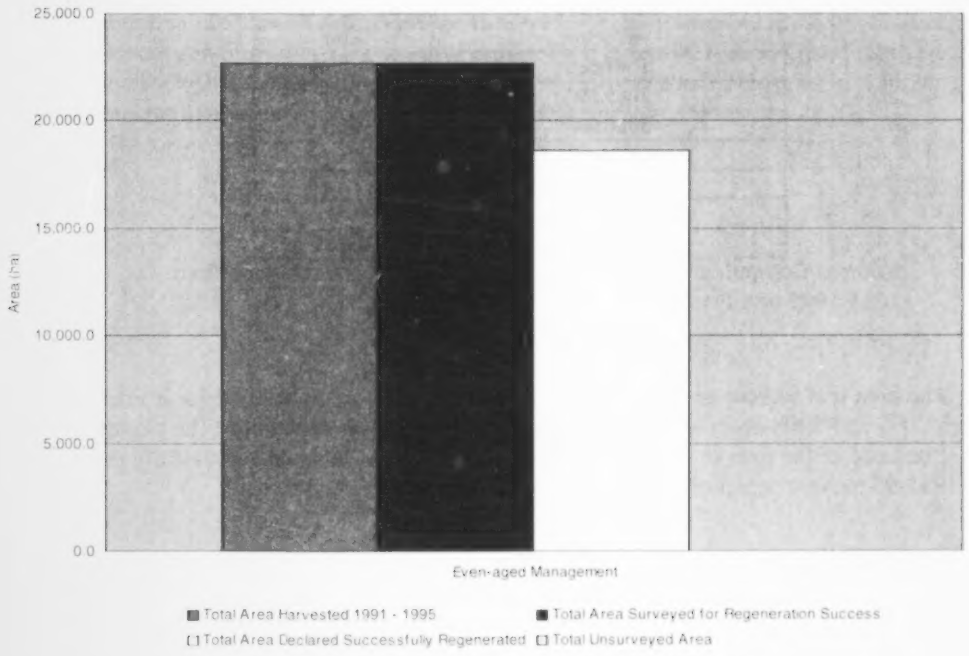


Figure 4. Harvested area successfully regenerated in hectares
Source: Information for this table and graph was obtained from Bowater GIS queries for harvest depletions for the period 1991 - 95. The FTG information was obtained from the current FTG data base for the Black Sturgeon Forest on the Bowater GIS system.

Since only 82% of the harvest depletions from 1991-95 has been declared FTG a further analysis of the GIS data base was undertaken to determine the status of the outstanding depletion area (table 7b). The outstanding area that is not classified as FTG for the 1991-95 harvest depletions has been classified into the following categories:

1. harvest depletions from 1995 that were planted or seeded in 1997
2. depletions from 1991-94 that had been planted or seeded but were burnt by a forest fire in 1996 (retreated in 1997 and 1998 with Forestry Futures Fund dollars)
3. harvest depletions mapped as naturals (mostly black spruce swamps)
4. the conversion and merger of the historic Lambert silviculture data into the new OBM inventory of 1996 (3% in Figure 5).

This analysis indicates that there are 2,787 ha. outstanding of 1991-95 harvest depletions that requires monitoring and surveys to determine if the silviculture treatments qualify for free to grow status. These areas will be candidates for surveys over the next couple of years. The annual survey program is determined by querying the GIS data base for the date of establishment of the silviculture project. The surveys determine if the candidate meets free to grow status or has to be monitored if it does not meet the height requirement or requires herbicide treatment to be released from competing vegetation.

2006 Independent Forest Audit
Table 7b: Summary of 1991 to 1995 harvest depletions not free to grow
Black Sturgeon Forest

Category	Area (ha)
Roads	594
Planted	1,833
Seeded	294
Natural	660
Unclassified	650
Total	**4,031**

Source: Computed from GIS records and queries of depletions from 1991-1995 and the results of free-to-grow surveys.

The area that is Free to Grow and the treatments that are scheduled for a Free to Grow survey in 2007 and 2008 account for 94% of the 1991-96 harvest depletions. The plantations that were lost because of the fires in 1996 accounts for why the area declared successfully regenerated for the 1991-95 harvest depletions is only 82% at this time.

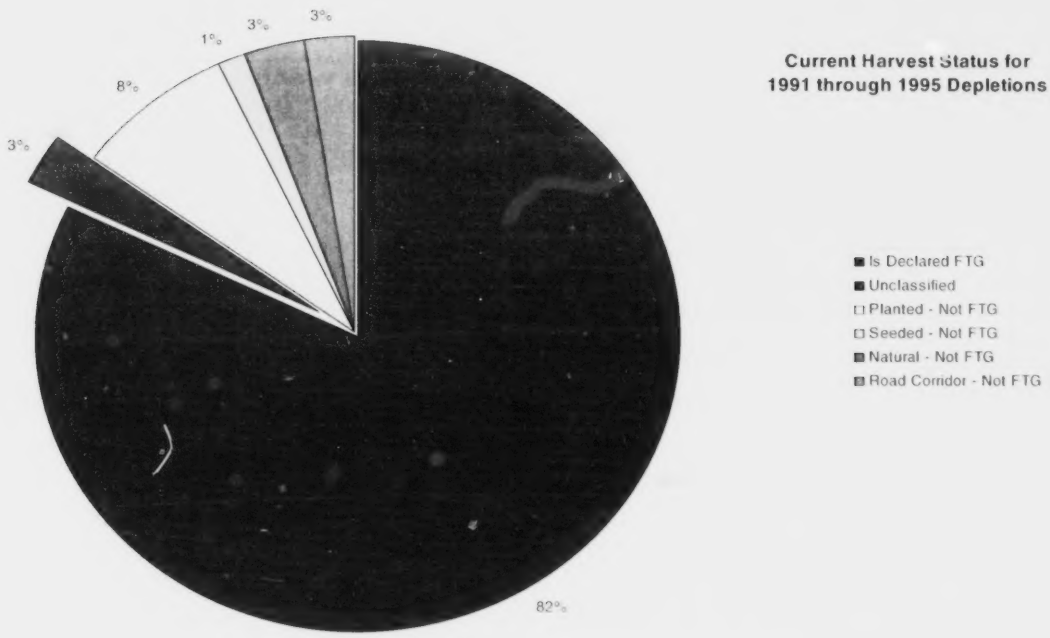
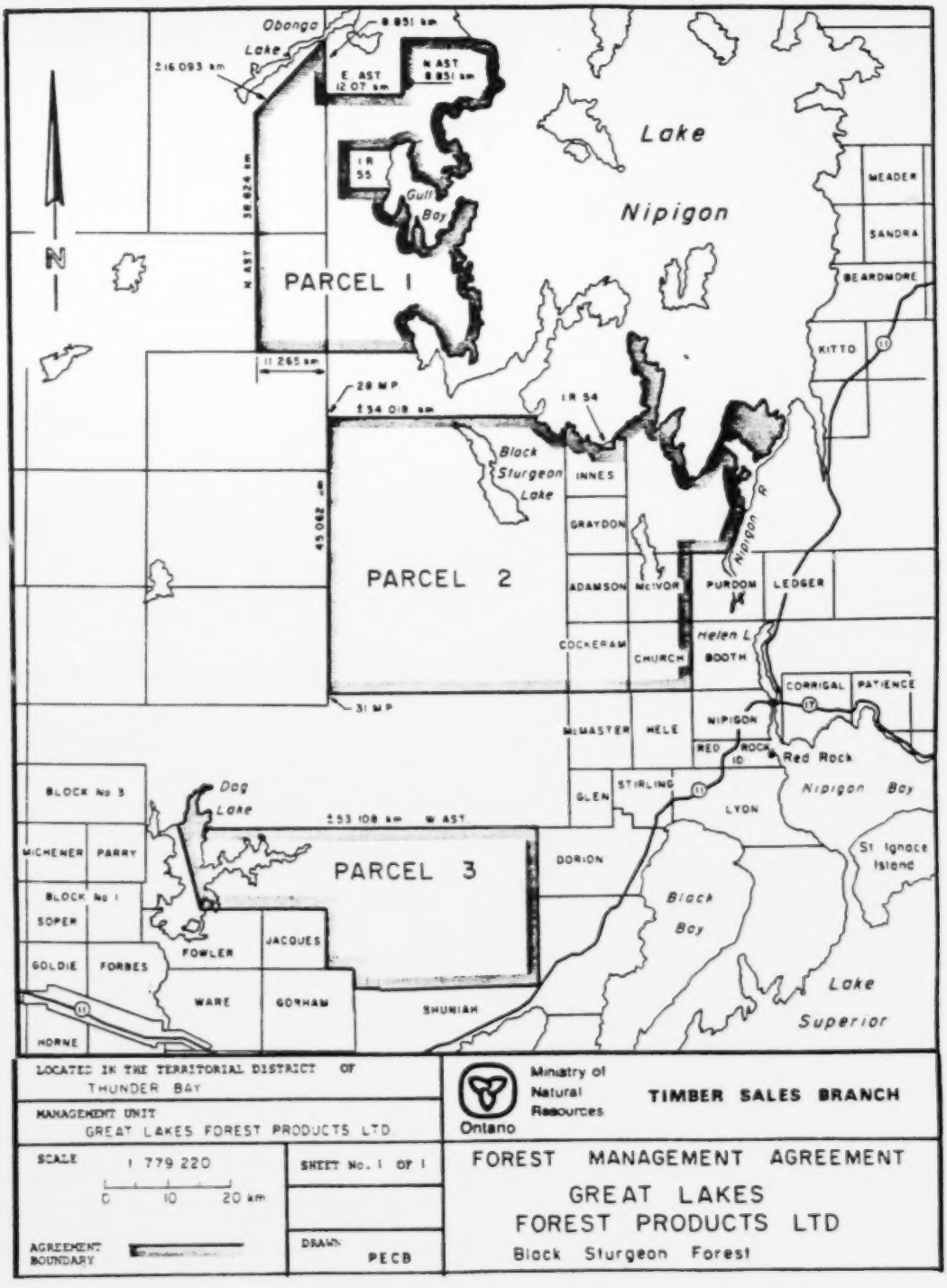


Figure 5
Source: Computed from GIS records and queries of depletions from 1991-1995 and the results of free-to-grow surveys.

The status of the harvest depletions for the 1991-96 TMP period (22,648 ha) is illustrated in figure 5. The outstanding areas will be surveyed for their potential Free to Grow status in 2007 and 2008. Therefore, the annual renewal program from 1991-95 should succeed in achieving the forest management planning objectives for the period.

Appendix – Maps of the 1986 FMA and 2001 SFL for the Black Sturgeon Forest

1986 Forest Management Agreement Area (FMA) for the Black Sturgeon Forest



2001 Sustainable Forest License (SFL)
Black Sturgeon Forest

Map 2 - Key Map Black Sturgeon Forest

Scale 1:2066284

Kilometres

0 20 40 60 80

Miles

0 10 30 50

Bowater Office

MNR Office

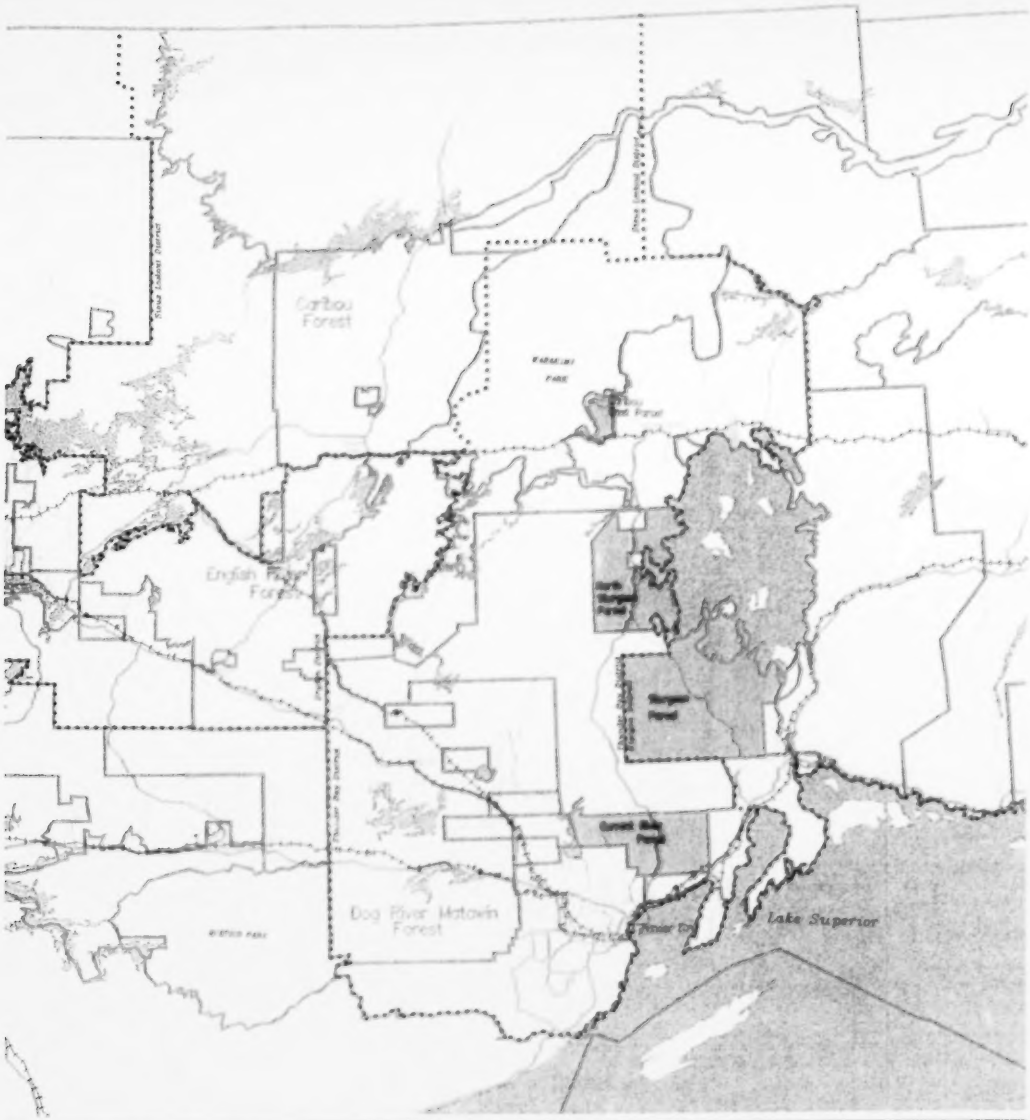
SFL Boundary

MNR Boundary

Highways

Major Roads

2001 Sustainable Forest License (SFL)
Black Sturgeon Forest



Map 2 - Key Map Black Sturgeon Forest

Scale 1:2066284

Kilometres

0 20 40 60 80

0 10 30 50

Miles

Bowater Office

MNR Office

SFL Boundary

MNR Boundary

Highways

Major Roads

APPENDIX B – AUDIT TEAM MEMBERS AND QUALIFICATIONS

Craig Howard, R.P.F., CEA (SFM) – Lead Auditor

Education:	B.Sc. Forestry, University of New Brunswick, 1983.
Experience:	22 years experience in forestry, 11 years in private practice, 3 years in the OMNR.
Previous Audits:	13 Independent Forest Audits, 10 Sustainable Forestry Initiative Verifications, 2 Forest Stewardship Council Assessments.

Mark Leschishin, R.P.F – Forester

Education:	B.Sc. Forestry, Lakehead University, 1978. Dip. For. Tech., 1974.
Experience:	27 years experience in forestry in Ontario.
Previous Audits:	10 Independent Forest Audits.

Tom Clark – Ecologist

Education:	M.Sc., H.B.Sc.
Experience:	Forest ecologist and biologist with 26 years experience in habitat ecology.
Previous Audits:	12 Independent Forest Audits, 13 Forest Stewardship Council Assessments.

Phil Shantz – Socio-economist

Education:	M.E.S, R.P.P.
Experience:	Registered professional planner with 14 years experience in forest auditing/certification, resource and socio-economics, land-use planning and public consultation.
Previous Audits:	11 Independent Forest Audits, 11 Forest Stewardship Council Assessments.

Brian Callaghan, R.P.F. – Forest Management Planning Analyst

Education:	B.Sc.F., University of Toronto, 1982.
Experience:	24 years experience in forestry in Ontario.
Previous Audits:	19 Independent Forest Audits, 12 Sustainable Forestry Initiative Verifications, 9 Forest Stewardship Council Assessments.

Anne Hayes, M.P.M. – Secretariat

Education:	B.S. (Plant and Soil Biology); Master of Pest Management.
Experience:	10 years experience as biologist in Ontario.
Previous Audits:	5 Independent Forest Audits, 2 Sustainable Forestry Initiative Verifications, 1 Forest Stewardship Council Assessment.

APPENDIX C – INDEPENDENT FOREST AUDIT GUIDING PRINCIPLES

Commitment	Commitment is reflected in vision, mission and policy statements of the company. Vision and mission statements are intended to provide long-term guidance for the organization. Policy statements reflect how the organization's vision and mission will be achieved. These statements must be reflected in the day-to-day operations of the organization.
Public Participation	The process of sustainable forest planning, implementation and monitoring is conducted in an open consultative fashion, with input from all members of the planning team, Local Citizens Committee, native groups, and other parties with an interest in the operations of the forest unit.
Forest Management Planning	The forest management planning process involves the input of a number of individuals and groups to describe the current condition of the forest, the values and benefits to be obtained from the forest, the desired condition of the forest in the future, and the best methods to achieve that goal. Certain minimum standards and procedures have been established upon which all management units are evaluated.
Plan Implementation	Verification of the actual results of operations in the field compared to the planned operations is required to be able to assess achievement of the plan objectives and compliance with laws and regulations. In conjunction with the review of operations, the reporting tables are tested to ensure accurate results are reported.
Systems Support	System support concerns resources and activities needed to support plan implementation so as to achieve the desired objectives. Appropriate control, documentation and reporting procedures must be in place and operational. Planned action should occur at planned times, in planned places and to the planned degree.
Monitoring	The activities and the effects of these activities in achieving management objectives must be regularly measured and assessed. In particular, the indicators of achievement must be assessed and their effectiveness reviewed.
Achievement of Management Objectives & Forest Sustainability	Periodic assessments of the management of the forest unit operations and the forest unit must be made in order to determine whether forest sustainability and other management objectives are being achieved. This includes comparing the actual values of the predetermined indicators against the planned values and assessing the reasons for any significant deviations.
Contractual Obligations	The licensee must comply with the specific license requirements.

APPENDIX D – LIST OF ACRONYMS USED

ACOP – Annual Compliance Operating Plan
ACSA – Annual Compliance Schedules of Action
AOC – Area of Concern
AWS – Annual Work Schedule
B&S – Barren and Scattered
BSF – Black Sturgeon Forest
BZA – Biinjitiwaabik Zaaging Anishinaabek
CFSA – Crown Forest Sustainability Act
CLAAG – Careful Logging Around Advanced Growth
EMA – Enhanced Management Area
EMS – Environmental Management System
FIM – Forest Information Manual
FMP – Forest Management Plan
FMPM – Forest Management Planning Manual
FOCIS – Forest Operations Compliance Information System
FOP – Forest Operations Prescription
FRI – Forest Resource Inventory
FSOS – Forest Simulation and Optimization System
FTG – Free-to-Grow
FWFN – Fort William First Nation
GIS – Geographic Information System
GPS – Global Positioning System
HADD – Harmful Alteration Disruption or Destruction
IFA – Independent Forest Audit
IFAPP – Independent Forest Audit Process and Protocol
ISO – International Organization for Standardization
KZA – Kiashke Zaaging Anishinaabek
LCC – Local Citizens' Committee
MNDM – Ministry of Northern Development and Mines
MOE – Ministry of the Environment
NDPEG – Forest Management Guide for Natural Disturbance Pattern Emulation
NRVIS – Natural Resources Values Information System
OFAH – Ontario Federation of Anglers and Hunters
OLL – Ontario Living Legacy
OMNR – Ontario Ministry of Natural Resources
QOL – Qualified Overlapping Licensee
RPFO – Report of Past Forest Operations
RSA – Resource Stewardship Agreement
SEIM – Socio-Economic Impact Model
SEV – Statement of Environmental Values

SFI – Sustainable Forestry Initiative
SFL – Sustainable Forest License
SFMM – Strategic Forest Management Model
SGR – Silvicultural Ground Rule
STP – Site Treatment Package
SWTIA – Superior-Woods Tree Improvement Association
WMU – Wildlife Management Unit

APPENDIX E – SUMMARY OF INPUT TO AUDIT PROCESS

General Public: Using the mailing list that the Ontario Ministry of Natural Resources (OMNR) maintains for the Black Sturgeon Forest (BSF), a survey was sent to 614 stakeholders on September 1, 2006. The survey was also posted on the BioForest Technologies Inc. web page. A public information booth was advertised in the Nipigon Red Rock Gazette on August 1, 2006, and hosted in the Intercity Shopping Centre in Thunder Bay on August 9 and 10, 2006. The purpose of the survey and the information booth was to provide members of the public with an opportunity to comment on the forest management that occurred on the BSF over the audit period. The audit team received 22 responses to the survey, a return rate of about 4 %. Thirty-two people visited the public information booth. Eighteen of the visitors discussed the BSF specifically, while the remaining visitors were interested in the audit process in general.

Local Citizens' Committee: A member of the audit team directly interviewed members of three LCCs. The individual interviews allowed LCC members to comment on the effectiveness of the LCC and the performance of both the Company and OMNR. In addition to the interviews, members of the LCC attended the field portion of the audit.

LCC members were generally supportive of the management activities taking place on the BSF, although the BSF is typically not the primary target of their attention. Concerns raised focussed on the current economic climate in the forest sector and, more specifically, what the government could or should be doing to create a more competitive forest industry.

Aboriginal Communities: The auditors spoke directly with members of three First Nations: Lac Des Mille Lacs First Nation, Kiashke Zaaging Anishinaabek (KZA) (Gull Bay), and Fort William First Nation (FWFN).

Consultation with First Nations led the audit team to make two recommendations. The auditors recommend that Condition #34 be revised to ensure that timber allocations consider First Nations' economic interests. It is recommended that OMNR review tending and renewal planned for the 2006 forest management plan in the Caribou East Parcel against Whitesand First Nation values.

Overlapping Licensees: Representatives from two overlapping licensees (Buchanan Forest Products Ltd. and Niigaani Enterprises Inc.) were contacted as part of the audit. Representatives from Niigaani Enterprises Inc. attended in the field.

Ontario Ministry of Natural Resources: The OMNR area supervisors, area foresters, area biologists, and technicians for both Districts participated in the opening and closing meetings of the field audit, as well as the field audit itself. The OMNR District Managers from Thunder Bay and Nipigon attended the pre-audit meeting. The District Manager from Thunder Bay was directly interviewed by the auditors. OMNR regional staff

attended the pre-audit, opening and closing meetings. One OMNR main office staff participated in the audit.

Bowater: The Divisional Forester and Senior Operations Forester participated in all aspect of the audit. The Woodlands Manager participated in the opening and closing meetings and several interviews.